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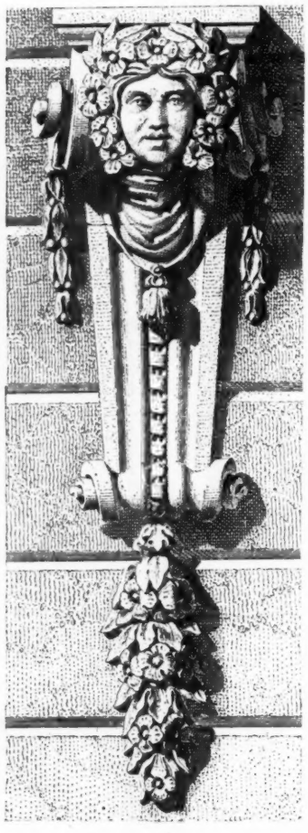
The Relation of the Architect to the Builder.*

BY O. P. HATFIELD, ARCHITECT, NEW YORK.



THE relation of the architect to the builder is a subject that is plain enough, and generally well understood. The architect determines the form of a building and decides upon the materials of which it is to be constructed. The builder furnishes those materials and erects the building. In most cases the architect stands by and gives minute directions as to all the details and minutiæ of the construction, and the builder, being forewarned of these requirements, executes them faithfully in all their manifold intricacies, to make manifest the complete expression of the architect's design. There is a divided responsibility—the architect is responsible for the *law* of the building, so to speak, and the builder for the proper execution of that law. They work together, shoulder to shoulder, and the building grows up under their hands, perhaps a noble and enduring monument, a new creation it may be, testifying to their skill and the honorable integrity of their work.

The understanding of all this is very plain; one building after another is erected; they go up on every hand, and the architect and the builder come to be looked upon as indispensable in their vocations, and altogether very useful persons in their way. To be sure, as the architect's labors imply a little more active exercise of his brains, and the builder's a little more close handling of heavy materials; the business of one is called a profession, and that of the other a trade; but both are regarded as equally honorable, and alike deserving to reapthe rewards of honest industry. A worthy ambition impels both the architect and the builder to excel in their respective spheres of action, and the fortunate result is that the community profits by their emulation. Neighborhoods are beautified and enlightened and cities made more stately and refined.

The design of a building is generally the work of one mind—it may be a master mind—who harmonizes the parts, adapts the several divisions to one another, gives a purpose to every line, and thus evolves the spirit of truth and unity to consecrate his work. The actual erection of the building is the work of many minds, of many skillful hands, under the close and careful direction of several masterful chiefs, whose steady control and management of their strong and trained assistants finally bring the structure to its desired completion. The greater portion of the work, however, devolves upon two of these chiefs, the mason and the carpenter, and they by common consent are named the "builders." The walls and plastered interiors, the floors, the doors, the windows—these constitute the bulk of the building, and these are immediately under their control. The mason and the carpenter, therefore, are the principal contractors for the erection of the building, and in most sections of our country the whole contract is taken by these, all other building tradesmen coming in as sub-contractors, engaging to furnish their work directly to the principal contractors. But should the building require a great quantity of iron or of stone those who deal in these materials frequently contract directly with the owner, and also take the position of principal contractors; and I believe it is much preferred by them to take this position.

All of these several contractors and sub-contractors look to the architect of the building for instruction and direction as to the construction, setting and general disposition of their work, and tacitly and courteously obey those instructions—always providing that they are within the several requirements of the drawings and specifications, which constitute the body of the contract. But, as everyone who has had anything to do with building contracts knows, no drawing or specification can absolutely embody all the details of the work called for, and the constant explanatory instructions of the originator of the design are therefore not only necessary, but they are desired and sought for by the contractor, and gratefully accepted. Not only is this the case with the contractor, but his men fall into line also, and regard the architect as the highest in authority about the building, governing their action accordingly, and taking his word as law in the smaller as well as in the greater details of the construction. They recognize the necessity of having some one chief who comprehends the whole plan of the work, and who can therefore reconcile the incongruities of the different branches of handiwork and bring order out of what seems to them a structural chaos. How many times do we hear workmen, when consulting with the architect, say, "Well, I will do just as you say." And their triumphal reply to all captious questions is, "The architect said so."

All this shows that in spite of the closest calculations of the builder, as to the quantity and the quality of the work, when he first makes his estimate of the probable cost, there is a wide margin of undefined detail that must be regarded in determining the exact sum to be named in his proposal. And it is true, also, that a close acquaintance with the methods of the architect is more or less necessary in determining the plus or minus quantities which enter into the calculation of this uncertain margin. The great disparity in the amounts of the estimates depends, to a certain extent, upon this feature of the calculation, and in this way suggests one of the several relations of the architect to the builder.

Although the architect really is, in his superintendence of a building, the agent of the owner, being in his employ and looking to him for compensation for his labors, yet he should not forget that he is also an expert and umpire, who is expected to maintain, always, a judicial frame of mind and dispense even-handed justice in all his decisions as between the owner and the contractor. He is supposed to be familiar with the best methods of executing the several divisions of work that enter into the construction of a building, and with the characteristics of the best qualities of materials as well as with those of the inferior qualities, and therefore capable of giving an unbiased opinion as to their merits, which, in most cases, the owner is not. The latter, therefore, relies upon the judgment, knowledge and experience of his architect to give a fair, honest and just decision upon all questions that may arise as affecting his interest or those of the builder during the progress of the work. The architect must be a man of character; his integrity must be beyond question, his judgment must be good, and his store of acquired knowledge in the line of his profession full and ample. The just mean of favor toward the two parties to the contract will then be observed by him, and the work will be brought to a close to the satisfaction of everyone. The owner will possess a solid, substantial building, and the builder, in addition to his cash profits, will have received a wider indorsement of his already good reputation.

Criticism is often exercised because the architect frequently shows that he has favorite builders, into whose hands he would prefer that the contract for his buildings would go. When estimates are required for his work in competition, it is to these favorite contractors that he issues his invitations for proposals, and should the owner suggest the names of certain new men as of good reputation and who had applied to him for a chance to estimate, the architect regards the application with not a little suspicion. This disposition of the architect is not infrequently regarded as partial, to say the least, and by this action he lays himself open to the charge of having some ulterior and not altogether worthy object in view. But another view of the case can be taken, no doubt the just one in a majority of cases. The builders whom he invites to estimate on his work are well known to him as men of good business qualifications, men who are in the habit of doing good work and doing it promptly. They have earned this first place in his regard by their sterling merit, by their intelligence, their skill and their fair dealing, and the architect knows that if he secures one of these men to take the contract in any case, one-half of his anxiety will be dissipated and a great portion of his labor of supervision be saved or the burden of it lessened. His success as an architect, therefore, depends in a great measure upon his ability to choose proper contractors for the owner.

Sometimes, however, when compelled to take one of these new parties, the architect makes the acquaintance of a very capable man, and at once puts him on his list as of one to be invited in soliciting future proposals. For of all men having to do with the erection of buildings perhaps the architect feels his responsibility the most, and he is, therefore, necessarily cautious as to whom he shall confide their erection. A wall or a whole structure may fall, and although it may be proved to have been owing to the use of inferior materials and workmanship by the builder, yet it is found to be more or less difficult to explain this to the public, and the architect's reputation to this extent suffers. Thus the necessities of the architect compel him to sift out the good contractors from the bad, and this winnowing process finally eventuates in purifying the trades and raising the standard of practice to a much higher level. At the same time the architect should extend to every builder, when asking the privileges of estimating, an opportunity to prove his standing by competent testimonials and a reference to extended work. When such a privilege is solicited by the builder it does not necessarily follow that his proposal is to be accepted, even though he may be the lowest bidder. But such a result may be accomplished, if he is able to demonstrate that his ability and business standing are so unquestionable that there is no doubt of his being able to fulfill his contract with satisfaction to both owner and architect.

For no fair competition in building estimates can be obtained where the standing of the bidders are not on a level. No man whose custom is to do honest work and to furnish the best materials desires to estimate in competition with those whose purpose is to supply neither the one nor the other. The conditions are not parallel, and it is only labor lost to attempt to bring down a proposal for good work to the level or below that of one which has been calculated for work of a much lower grade. It is very necessary, therefore, in issuing invitations for proposals, that regard should be had to the uniformly good character of the builders, in order that no wrong may be done to those whose intention is always to act in good faith and to maintain their usual high standard of work. This relation of the architect

*Paper written by O. P. Hatfield, architect, and read by John McArthur, architect, before the third annual convention of the National Association of Builders at Philadelphia February 13, 1889.

to the builder is one of great delicacy, and calls for a well-guarded circumspection on his part, that well-earned privileges may not be sacrificed. The care here demanded in selecting the principal contractor for the work is just as necessary in the selection of the sub-contractors. He therefore evinces a certain amount of reasonable concern, when the principal contract is awarded, as to who are to be the sub-contractors, and thus there is established an interested relation also between the sub-contractor and the architect. Fortunately for the latter, the former knows that it is necessary for his work to pass the inspection of the architect and to meet with his approval before it will be accepted by the principal contractor.

A certain amount of unavoidable delays inevitably arise in the erection of all important buildings, and of some that are not so important. These hindrances to the progress of the work are caused most frequently from a want of the prompt delivery of material, and not seldom from the non-reception of the necessary working-drawings from the architect. The latter, therefore, should maintain a perfect system in the working of his office, so enforced as to cause the least delay possible in the production and distribution of such drawings, furnishing for each sub-contractor the class of drawings required for his work in the order in which it will be required at the building. Many of these classes of drawings have to be prepared at one and the same time, as the dimensions figured upon one class have to be transferred to another, and only a watchful care can insure their delivery in time for the proper preparation of the work to which they refer. It is only just that the builder should be provided with the necessary working-drawings in good time, and so as not to delay the execution of all his work in its necessary sequence. This desired end may be greatly facilitated by the close attention and determined application of the architect in his administration of the forces of his office. Many drawings can well be postponed, while others more urgently required can be prepared in their stead.

In preparing the specifications, also, the architect should have regard to the convenience and necessities of the builder. The description of the different classes of work should be so made as to include and concentrate under the several headings all the articles and details of work belonging to the various divisions respectively. A sub-contractor estimates of necessity upon a large amount of work, upon which, either by reason of his estimate being too high, or by some preference shown a competitor he fails to be successful. He, therefore, gets into a habit of estimating hurriedly, and in doing so, should he omit any item from his calculations, he would have to submit to a loss. This very undesirable result may be in a great measure prevented by bringing all the items of work furnished by any such sub-contractor under one special heading, and not distributed in dribbles throughout the specifications. The principal contractor is also then assured that he will not have to make allowance for such stray items in his own estimate, and a much more satisfactory result is obtained. In estimating for proposals upon a building of any importance, duplicates of plans and specifications should be furnished by the architect, either of blue-print drawings, or otherwise, in order that the estimators may make their computations at their own offices.

Thus by a close observance of their several duties and obligations, on the part both of the builder and the architect, their relation one to the other may be made to be pleasant, as well as profitable, and a feeling of genuine, mutual respect be engendered, that will serve to greatly soften the asperities of their somewhat rugged, but parallel paths. It is to be hoped that every architect and every builder, be he of low or high degree, may feel called upon to contribute his portion of the good will and high endeavor necessary to secure this very desirable result.

Plastering and Stucco Work.*

BY JAMES JOHN, CHICAGO.

IT has not been the fate of this simple, durable and inexpensive material to escape the assaults which every good thing in this world must encounter at one time or another. It has been called unclean; but it is not so of itself. Like many another wholesome and useful medium, it can be so illy made and be so indifferently applied as to offer to dirt and insects abiding places due to the perverted ingenuity of man, not to the inherent defects of itself. In spite of all that has been said against it, it remains the universal lining for dwellings throughout the civilized world. Wealth may incase walls and ceilings in decorative woods and metals, but for the mass of mankind plaster must continue to be the simplest, cleanest, least costly and most enduring finish for homes. The health of the vast majority of mankind is, therefore, largely dependent upon the materials used in its mixture and the principles which shall actuate its proper employment.

It is undeniable that the custom that obtained some years ago of applying plaster into highly ornate designs was for domestic purposes unsanitary. The foliated, convoluted and otherwise multiform designs which used to be spread out upon ceilings, in cornices or special pieces, are gradually passing out of use. Their innumerable crevices served only as receptacles of dirt, in which the deposits were continuous.

The ornamental uses of plaster having been reduced by good sense and good taste, it remains still the most vigorous, as it is the oldest vehicle for carrying down generation after generation the masterpiece of art with which the golden age of sculpture enriched the human race. Humble as its components are, common and cheap as it seems beside marble, and paltry when compared with the metals that have, to a considerable degree, taken its place for reproductive uses, it *still* preserves the plastic art and enables youth to contemplate antiquity in its noblest achievements. Today plaster is revolutionizing industrial art; for us, and, in all probability, for those who are to come after us, plaster, lowly and cheap, but docile and durable, is the connecting agent with this greatest of men's indorsements in the past.

Plaster thus employed in duplicating works of marble, iron and bronze, is today extending the finest industries, modern and ancient. The erection of the new museums in England, near the great manufacturing centers, would be next to useless were not plaster available for distributing fac similes of the works, whose grandeur has made the name of Greece imperishable, and whose usefulness in development and the study of form, for all arts, is acknowledged to be unequaled. So potent is this simple medium, therefore, that it serves today as effectually as marble itself for the perpetuation of fine art; and by its endless variations of models, copied from every other material known in history, it is the supreme teacher of design. The reproduction of classic works at Kensington, and their dissemination throughout the provinces of the United Kingdom, has had the effect of making France fear for her supremacy in fine industrial productions. The important part that plaster thus plays in the Old World it will continue to play in the new. Wherever art places its altar, plaster will be there as its handmaid; and though it may be abused by carelessness and calumniated by more pretentious rivals, it must remain the most faithful friend of progress in taste, in science and in decoration.

Noble and varied as may be the uses to which plaster has and may be applied, I regret to say that the art of applying same, as a vocation, for the lining of dwellings is today so unremunerative to the artisan that it *almost* ceases to enlist the skill and intelligence that the art should command. This is due mainly to the want of appreciation by the architect and owner, whose only thoughts are for a semblance, for the time being, and are tempted by the questionable economy of saving a few dollars into letting contracts to men of no mechanical standing. It is hoped and expected that through the influence of the National Association of Builders, and the intercourse its executive officers may have with the reputable architects of the country, that the day is not far distant when it will be required of the artisan in the various branches pertaining to buildings, to arm himself with a proper and authoritative testimonial, giving proof that he *is skilled* in his art, and thus divest the wheat from the chaff, and the former be recognized and the latter find its level.

It is a well-known fact that plaster on a ceiling surface, in the event of fire, will detain it for a long time, *providing* any means have been taken *when* applied to secure it under such circumstances, and were these means more generally employed millions of dollars would be saved to this country annually.

As the fireproof construction is the exception, and as wood construction must predominate for years to come, therefore, more attention should be given to make the latter structure more fire-resisting.

During the last twenty years I have devoted much thought to this subject, and some of the devices I have had in that direction I have sought to secure by letters patent, and, strange to say, came in conflict with an English patent in the archives at Washington, bearing date 1797. The device then discovered has been slumbering there nearly one hundred years, and *today*, I know of nothing *more economical or effectual* to secure plaster in position in the event of fire than this same device. It is simply a wire netting, as used today for a foundation, but as these described placed over the bottom surface of the plaster, and then securely stapled to the furring or joints, and afterward the finishing coat of plaster applied over the surface. And as most every mechanic has at some time or other taken out a patent, or applied for one, it may be interesting to you to hear the language that Edmund Cartwright (as that was the name of the applicant) used in paying due deference to his sovereign lord.

After describing his invention in substantially the same language that obtains in patents of the present day, he closes thus:

"In witness whereof, I, the said Edmund Cartwright, have hereunto set my hand and seal this eighth day of November in the thirty-eighth year of the reign of our Sovereign Lord George the Third, by the grace of God, of Great Britain, France and Ireland, King, Defender of the Faith, and so forth, and in the year of our Lord one thousand seven hundred and ninety-seven."

* Paper read before the third annual convention of the National Association of Builders, at Philadelphia, February 13, 1889.

Builders' Exchanges—Their Advantages and Opportunities.*

BY W. H. SAYWARD, SECRETARY N. A. B., BOSTON, MASS.

TO those who have for many years been members of some of the well-established exchanges of the country, it may perhaps seem unnecessary to say anything in the way of demonstration of the advantages of such institutions, for the benefits experienced have become so much a part of daily business life that they are accepted as customary—as a matter of course.

To such I may say, you must understand that what seems to you an ordinary condition is, in point of fact, an exceptional one, and where the builders in one city are reaping the advantages of well-organized exchanges for the transaction of business, the builders of at least two-thirds of the cities of the country have either no exchanges at all, or support organizations that, from lack of good methods of administration, are hardly deserving the name of exchanges of builders and traders. It is largely for the illumination and information of such builders as these referred to that I am to speak, and I must ask their more favored brothers to submit with patience while I recite the story which is so familiar that they may be tempted to call out "chestnuts," and yet which may be a revelation to many others.

When I reach that portion of my subject which comprehends the "Opportunities of Exchanges," I apprehend I may have something to say which will at least be directed to all, even if I do not succeed in making it interesting or instructive.

The advantages accruing from the habit of gathering together in one particular place at specified hours on every business day are perhaps more certain and definite to builders than to men in trade, and yet, builders have been almost the last among business men to establish this convenient and regular method of personal, every-day contact for the transaction of business.

I want to state just here that by far the larger proportion of builders' associations in this country are not established upon the fundamental feature of an exchange, namely, daily meeting at a specified hour for actual business purposes. They are not, therefore, in a true sense, builders' exchanges, although in some cases they bear that name, and they do not begin to realize the advantages they ought, or develop the strength which this daily contact creates and encourages. Boards of trade, chambers of commerce, merchants' exchanges, have existed almost as long as trade has existed for the readier interchange, or, more properly, the exchange, of business information.

Shakespeare even has given us a clue to an exchange extant in ancient Venice, for he makes Shylock speak of the Rialto, "where merchants most do congregate."

In the first place, a builders' exchange is, or should be, a rendezvous, a common place of meeting for those engaged in the various branches of building, whose trades have to be prosecuted in conjunction with each other; also for those whose lines of business make it desirable for them to frequently see the contractors in various trades for the purpose of selling material.

Viewed simply in the light of convenience, this daily meeting together of men engaged in various branches of the building business carries with it benefits so obvious as to hardly require reference.

But let us look for a moment at the particular reasons why these advantages are greater for contractors in various building trades than for other business men.

Merchants, men in trade, need to see each other daily "on 'change," it is true, but besides that they have a local habitation, store, warehouse or office, where, for the greater part of the day, they expect to be on duty for the transaction of business, and where others may be reasonably sure of finding them.

With builders the situation is radically different; comparatively few builders have shops and offices, and even for those who do, the necessities of building require their personal presence here, there and everywhere, wherever their work may be going on, and it is the exception to find them at what may be termed their places of business.

By far the larger proportion of builders in the various trades have no shops even, for they do not need them, storehouses, or "lockers," as they are commonly called, meeting and filling all their needs, while their offices are in most cases in their homes, where they can use their evenings for "keeping books," estimating, and other office work.

The more modern methods of carrying on the building business, however, are tending in the direction of separating the business from the home-life, and I am very glad that it is so. Offices are getting to be more common, and work that used to be done by weary hands and exhausted brains at night and in the home is delegated to others, and to a place specially set apart. This is as it should be, but the other conditions referred to must always prevail. The builder must superintend his work wherever it happens to be, and therefore must continue to be an unreliable individual as to his whereabouts, and all the more unreliable in proportion to the number and location of his various jobs.

It is this peculiar characteristic of the building business and the builders' practice which makes the common meeting place of many men in the various trades in a city of the greatest advantage and convenience. It means, as the very first element of value, the greatest economy of time—and time, to the builder, of all others, means money—for it goes almost without saying that the builder who must need to see various other builders whose work is commingled with his, and yet who are as unreachable, with any certainty, as he is himself, finds the most complete saving of time in the rendezvous of the exchange, where he and those whom he needs to personally meet, and who need to have the same personal contact with him, have established the custom of being each day at a definite time.

On the floor of the exchange at the recognized "change hour," the builders may be reasonably sure, on any business day, of finding those men whose work must be prosecuted along with theirs, and whom they, in consequence, need to see to talk up some detail, or whose experience they wish to consult as to the feasibility of certain work, or whose estimates they want for immediate use, or whom they wish particularly to see without delay to correct some error, make some change, or hurry some particular portion. If one builder needs to see others for the quick consummation of many points in a short time, so they in turn wish to see him, and also to see others still, so that there is a perfect chain of convenience going on in endless combinations, and yet without confusion.

I have spoken, so far, in a general way of the convenience which accrues to the various builders by their being able to see many of their colaborators in a single hour, to accomplish which, by any other means, would occupy many hours, perhaps days. There is still another class of men whose lines of business bring them closely in contact with builders, whose interests are directly catered to by this daily congregation. Dealers in material find here their very best opportunity to meet the men to whom they wish to sell their goods. In the limits of an hour, and within the walls of one room, they are sure to find each day, or nearly every day, the men whose trade they seek.

The accomplishment of so much personal interviewing in any other way—and none of the modern conveniences of telephoning can take the place of it—would mean miles upon miles of travel, and hours upon hours of disappointment. In the economizing of time for the seller there can be no such sure recipe as the builders' exchange.

The presence of the seller, too, is in turn a direct advantage to the builder, and much time and patience is saved by the opportunities offered for personal explanation, so persistently needed in the purchase of the goods the builder uses.

The common meeting place then, once established as a daily habit, becomes as indispensable as any other of the many conveniences which aid the transaction of business and assist in the many movements of life.

The question may be asked, "Cannot I get along without it?" or the statement made, "I can paddle my own canoe."

Yes, anyone can "get along" without it, and can "get along," too, without many of the helps which experience has raised for the advantage of the world. Anyone who chooses can "get along" without using the steam transportation which now whisks him over the continent from Atlantic to Pacific in as short a time as it formerly took to travel from Maine to New York. He may, if he chooses, "get along" in the old-fashioned stage coach, but I imagine his journeying would be rather lonesome, and his feelings rather mortifying on arrival, to find that though he has "got there all the same" his competitors have "been there" and gone!

One may, if he chooses, in these days of rapid concentration, "get along" without using the telegraph or telephone and may send his messages by mail, taking an hour or a day, instead of a few moments of time, but I apprehend that he will discover that it would be wiser to use the means that his contemporaries are using, and save unnecessary friction in the accomplishment of his designs.

One may "get along" without using the aids that machinery has brought to the various details of work. He may, for instance, plane all his lumber by hand instead of using the power planer; he may, in fact, refuse any and all of the "lubricators" which have been invented to ease and shorten labor, but by so doing he will "get along" painfully, and "get left" even though he "gets along."

So, too, one can "get along" without the exchange, but it is a fact that cannot be disputed that he can get along much easier, accomplish much more in the same length of time, save travel and avoid unnecessary labor by this very simple means. It is very amusing, and at the same time somewhat annoying to those who have the management of well-developed exchanges, to receive quite frequent visits from some of the builders or dealers who assert so constantly and confidently that they can "get along" without the exchange, and who, when reminded that they are getting the advantage of the rendezvous, say "Oh, yes, I find it very convenient sometimes to run in here to find people whom I must see without delay," sublimely unconscious, all the while, that they are paying the highest tribute to the utility of

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the exchange idea, and apparently unmindful that in the occasional benefits they derive from the certainty of finding certain people at a definite place and at a definite time, they get for nothing what it costs others money to provide.

Nothing is more fallacious than the idea that the relative value of an exchange to the individual depends upon the frequency of his visits and the length of time he remains there.

The value of the postal service, the police service, the fire alarm or any of the departments maintained for the general good, is not demonstrated simply by the *number* of times that they are utilized every day, but by their certainty of operation when needed.

The individual who uses the exchange but once or twice during the week, may secure the same degree of advantage which the constant attendant gets; that is, he gets, when he wants it, the convenience which it is important he should have.

However few times during the week or month or even year the intermittent member uses the exchange, it is always there ready for use, and the groups of men are where he can put his hand upon them whenever he may need them.

It would be impossible to state in figures, with any degree of accuracy, the value to any individual of the exchange rendezvous, any more than the value of banking privileges and conveniences can be so stated — today the individual may get absolutely nothing from the contact, tomorrow he may secure a definite advantage, that may mean hundreds of dollars. In my personal experience I recall an occasion when in five minutes' time the exchange was worth $5,000 to me — and this is but an example of many other *unrecognized* helps.

I have endeavored to briefly outline the exchange idea, and what it means in a very practical way, simply from the one standpoint of convenience, with its resultant economy of time; but I must not omit to say something in regard to the administration of the exchange and the many ways in which convenience may be ministered to, and the exchange made attractive.

To simply have a rendezvous need not mean more than the barest and most meager of accommodations, in fact, it might be only a meeting place upon the open street, the same as years ago in Boston the mechanics first established the custom of meeting "upon change," in humble imitation of the merchants who also were without a habitation and found the sidewalk a satisfactory place of meeting. What these ancient men used to do on rainy days, or when the storms of winter made it not only uncomfortable but impossible to use the public street as a place of meeting, I am not informed, but it is a fair inference that some shelter was obtained, which probably was a suggestion in itself that it would be worth while to have a permanent cover for pleasant as well as stormy weather.

The exchange, in its management, or "administration," as I like to call it, should be liberal, progressive. In and about the rooms which are to be the business center for so many people during so many hours in the course of the year, the comfort of those who are to occupy them should be a constant consideration. Appointments that shall comprehend all the improvements of the day should be freely placed at the service of members.

I shall take it for granted that the location of the rooms will be as central as possible in the financial, business portion of the city, but will briefly say that a location which is good enough for a first-class bank or a board of trade is not far away from where a builders' exchange will find it for its advantage to be.

Light and air are said to be very cheap, but though this may be true enough in its original application, it is truer still that they must be vigilantly sought and persistently striven for.

Two things should be considered indispensable in locating an exchange, namely, good light and favorable opportunities for ventilation. It is very unfortunate when for any reason the rooms selected for an exchange are dark and "stuffy." There can be no reason satisfactory enough to warrant such selection, and I say very decidedly that until these two fundamental features can be secured, better be without the exchange. I say this with the more freedom, because I know that it is always possible to obtain these two important desiderata, and there can be no excuse for neglecting them.

Money will always secure proper quarters, and there should certainly be no niggardliness in the selection of a home which shall have these prerequisites of comfort, or be susceptible of such alteration as may secure them.

A good location obtained, and opportunities for light and air secured, the next thing should be to utilize them and make the place attractive and refreshing to all who enter the doors. It is true that it is a place for business, but it need not be any the less cheerful on that account. It will need constant, daily attention to keep the apartments in cleanly condition, but it will pay! The merchant, the banker, the architect, the owner who visits the exchange will not fail to be favorably impressed if he finds everything ship-shape, sees that care is taken to have the rooms presentable at all times, with windows washed, floors scrubbed, brasses polished and every nook and corner cared for, while they will be unfavorably impressed in proportion as these things are neglected; but it is more in behalf of the members themselves that I urge attention to these details of order and cleanliness, for I am convinced that they are elevating in themselves, and the more one is accustomed to them, the more distasteful will untidy ways become, while personal habits even will be unconsciously modified by the constant suggestion of better things in one's surroundings.

The sanitary and toilet arrangements should be as perfect and complete as in any first-class hotel, and should be kept fresh and wholesome by daily care.

Too much cannot be said of the value of these two items of administration, and the appreciation of them can only be measured by the extent to which they are taken advantage of in well ordered exchanges, or by the outcry which would be made if these luxuries should be discontinued. Individual letter boxes for mail matter or messages for members are indispensable and should always be under lock and key. When possible, "lockers" large enough to hold a roll of plans and some few personal effects should be provided, also under lock and key. Writing tables supplied with stationery and writing materials are, of course, indispensable and should be kept, the same as all else in the room, in the best and freshest condition for use by constant daily service.

The telephone service should be of the best and in this, as in every other modern device made use of, the management should keep abreast of the times by having all improvements as rapidly as they are presented.

In fact, without particularizing further, everything that members can possibly expect to find in such place should be obtained, of the very best sort, and the management should be constantly on the alert to anticipate wants and provide such accessories as will put builders' exchanges on a par with any and all others.

There is really no such thing as completely stating all that can be done in this direction, for new demands are constantly springing up and they should be gladly met as indicative of growth in the right direction, as evidence that builders have ceased thinking that anything will do for them, and have found out the advantages of an exchange.

The various things which I have mentioned help to emphasize the convenience of the common meeting-place and, when once realized, will not be readily relinquished. To secure all these advantages there will have to be liberal expenditure, and to make this possible there should be no narrow ideas in the matter of the annual assessment upon each member.

It should always be borne in mind that the practical, every-day benefits of which I have spoken and to which I have confined myself, are not the only ones to be provided for, and yet these alone are sufficiently valuable to warrant a payment by each individual much greater than he will ever be called upon to make.

The aggregate expense of running an exchange upon liberal principles may be large, but the expense to the individual will be light and, in comparison with the benefits received, may be considered as absolutely insignificant. Yet there can be no greater mistake made than to scale down the annual assessment to a figure so low that the only wonder is that any assessment at all should be made.

That which costs little or nothing is seldom of any value, and the membership which is attracted by the fact that the assessment is small is not of a character to increase the desirability of the institution. I shall have more to say on that point later on. Make the advantages of meeting together and the conveniences with which you surround yourselves so evident that membership with you will be sought almost regardless of expense.

These institutions should not be run as money-making machines either, but rather as money-spenders, so long as there are legitimate ways in which the interests of the whole may be fostered and cared for, and as long as the building business exists there will be field enough for this sort of work—of this, too, I shall speak in the other branch of my subject.

Turning now from the consideration of the practical advantages of the exchange as a business rendezvous, I wish to say something of other things none the less practical, but of a character so little developed or understood that they may be spoken of at present as unimproved opportunities.

No portion of the business community has ever needed the steadying of uniform methods more decidedly than the builders, and none have been so absolutely without them. No kind of business has needed so urgently the blessings of system in its contact with others as the building business, and yet, of all others, it seems to have been the most uncertain and aimless, therefore the most imposed upon.

The very character of the business seems to invite irregularities, and its multitudinous complications make the situation an extremely difficult one. This condition, which in itself has been and is *likely* to be vexatious enough, has been and is rendered still more serious by the fact that the large proportion of building mechanics have been illy furnished with the fundamentals of education, and have been exceedingly rudimentary in their ideas of business and business methods. Coming largely from the working classes, so called, they have been, by the circumstances of their birth and the necessities of their environment, deprived of the opportunities which sharpen the intellect and prepare the nerves for the conflict of business life.

It speaks well for the native worth of the men who have made the building business honorable and successful, when we consider the obstacles which have been overcome; but we find an explanation in this fact of lack of business training of much that has burdened the builders of the past, is still burdening the builders of today, and is likely to be a factor in the conditions of the future, although great changes for the better are bound to flow from the more general education of the people, and the efforts which we, as builders, and as intelligent business men, are making for the benefit of ourselves and our contemporaries, as well as for the future builders of the country.

Here, then, is the field of neglected, or rather unimproved opportunities which the builders' exchanges of the country should look upon as their particular province of usefulness, and to cultivate which the relation which they have established with each other, primarily as a matter of convenience, will develop into the very best foundation for practical and permanent results.

Stated concisely, the opportunity is this: The establishment of system, the maintenance of uniformity and concert of action, the definite statement of just and proper methods, which shall develop a "practice" to serve as a guide in all controversies, whether they be between builders themselves, or between builders and the rest of the world, to the end that builders may know precisely their rights in the

premises; the provision of means whereby irregular and improper practices may be checked and dishonest methods punished; in short, the standing upon guard, as it were, for the general interests of the whole, and through that the interest of the individual, with the same watchfulness that is exercised for the comfort, convenience and protection of those who come into the shelter of the exchange rooms for the transaction of business.

Brought together at first simply for the purpose of securing convenience in transacting business with each other, a relation is established which makes possible at once that united action which alone can bring about reforms, or establish definite methods and practices. The purposes and desires of the individual are inoperative until a sufficient number of other individuals not only think the same, have the same purpose and desires, but *act* in concert with him to the end that there may be a definite result.

To secure any decisive end it is necessary to consult together as to the best course of action to secure it, for it is very evident that though many individuals may desire the same thing, if left to follow out the idea each in his individual capacity, and from his individual standpoint, the worst sort of confusion would ensue and the end sought for would not be obtained.

The exchange idea utilized primarily for a purely business purpose creates a certain community of feeling, establishes a common interest, accustoms the members to each other, puts them gradually *en rapport* with each other, makes it seem natural to act together, puts them "into condition" as it were, easily and most imperceptibly, for the exercise of that cumulative force which alone produces appreciable results for the general good.

Men who are in the habit of doing business together, who meet each other day after day, and day after day, are the very ones to hold up each other's hands in the pursuit of any object for the benefit of the whole, and it is a natural sequence that it should be so.

All work which I am considering under the general head of "opportunities" might be called "association work," as distinctive from "exchange work," but both departments need the sinews of war, and while the collections may all be made through the exchange, the amounts called for should comprehend a large expenditure, if necessary, under the head of "association work."

The "sinews of war"—yearly assessments. It is on this rock that many associations "split," and if they do *not* split they are stranded and comparatively helpless. As I mentioned before in treating the other branch of my subject, this question of the funds necessary for the carrying on of association work must be looked upon in broad and liberal fashion.

Associations should not be entered into with the expectation that the return is coming in somewhat the same way that it comes from an investment in bank, railroad or real estate; yet a large majority of men are staggered by a yearly assessment at all commensurate with the importance of work undertaken, crying out, "I can't see any return for my money." I feel assured that if they thoroughly investigate the ultimate gain that comes to them in the protection to individual interests through aggregate combined action, of which they form a part, and which their stipends help to sustain, they will no longer exclaim "I want dividends on my investment," but will say, rather, "I am not paying anything like as much as I ought for the good attained for the whole and in which I am an individual gainer."

It would be hard to definitely state in dollars and cents the gain that is to be from any one of the objects which we are gathered here to promote, yet the dullest mind must admit that the gain to the whole community of builders will be enormous, while the share of benefit which each individual will receive is as impossible of definite statement as it is positive in fact. It is a well-worn maxim that "republics are ungrateful," and it is equally a truism that members of associations are ungrateful and quickly forget what has been *saved* to them, in their anxiety to get a dividend back from "dues" which they should really look upon as payment altogether insignificant in proportion to the benefits derived. All this argues from the premise of a properly managed association producing good for its members, protecting their interests. To secure this sort of an association, it must be a permanency and always in active service. Ability must be at the helm and must be properly remunerated for constant service.

I am convinced that but few business men have anything but a superficial idea of the purposes, possibilities and legitimate work of associations. They look upon them as a sort of special arrangement to meet a special emergency, and when that crisis is past, that the association may be permitted to languish, to be revived again when some special demand again calls for special action. Such spasmodic attention to the machinery will, to my mind, greatly deteriorate its vitality, and will ultimately destroy its reliability and facility of movement.

It is the most natural thing in the world for men to peruse their individual callings, conscious all the while that many evils exist which will be detrimental to their interest some time or other, but relying upon their good luck to provide for them a way of escape for the present, and as long as they do escape they appear to be content. But evils will not remain at a standstill, and if neglected are sure to increase, while "good luck" cannot always be relied upon. Discretion, therefore, would seem to point to keeping everything in readiness for action and to making a study and a business of eradicating evils.

Associations should be treated in the same way that any regular department of work is treated—in a business-like way; associations, in fact, should be made a business. For this reason the exchange proper, with its constant life and action for the support of a condition favorable to the transaction of business, furnishes the best possible basis for active and effective association work; the bearings, so to speak, are all oiled and the wheels ready to set in motion; no waiting for the preparation of machinery is necessary; it is always ready and can be put into service at a moment's notice. Things that are not absolutely evils that need reforming are also the opportunities, if not the absolute duties, of associations. It is time for something more than negation; we should not occupy ourselves solely with saying *this* is wrong and *that* is wrong—we should have foresight and wisdom enough to *prevent* wrong by preparing better methods and by establishing the *right*.

That we may take this advanced and positive ground, we must have competent hands and brains to work for us, for the bulk of the members in every exchange and association must perforce be busily engaged in carrying on the manifold details of work, and should delegate certain preparatory study and work to others. This kind of service is needed all the more now that we have a central organization which plans the work and specifies and recommends the methods best to be followed, leaving the details to be carried out by the filial bodies.

There is enough, yes, more than enough to do, and filial bodies of this great national mother must recognize their duty to her and their opportunities for themselves by carrying out through men specially selected for their fitness for the work the many things there are to do and always will be to do.

To get such men they must be properly paid, and the money will be well spent, for a single brainy man may, by his alertness and skill, stop a leak that, neglected or unseen, would bring untold disaster to many.

Such men are the surveyors and engineers who carefully examine the ground on which and over which we are to build, and foreseeing dangers, prepare a way to avoid them to be approved and sanctioned when laid before the associations for action. These are the men upon whom we must rely for the making a business of association work, who are to labor when the rank and file of the membership are closely engaged in their private affairs; they must do the studying, prepare the ways, suggest the methods and get things into definite shape for others to act upon—the others haven't time. Protect yourselves, then, by having men in your service whose business it is to *find* time and to improve it for your benefit.

Let no one say, "There is not enough to do." I have been there and I know there is plenty. But if you want a definite suggestion, let me say, right here, that there is one subject which for many years is sure to be large enough to warrant the best of work, the closest care and watchfulness of the best men that each of the affiliated bodies can secure, and that is, the apprenticeship plan approved by the National Association of Builders.

And I will say, also, although it is not directly called for by my subject, in answer to those who question the desirability of this national body. If it has nothing else to do but the complete establishment of this system, in that alone is there warrant enough for all the time, for all the money, for all the brains that can be put into it for the next twenty years to come. And if for the central body this is true, then is it equally true for the filial bodies.

One of the results to follow from the greater activity of builders' exchanges, through improving their opportunities, will be a greater prominence in the eyes of the public, and the value of builders, as men of affairs, will be recognized as never before. Their desirability, as practical men in positions of public need where their experience will tell for the general good, will be continually before the communities in which they live, and they will not be so often forgotten, as heretofore, when men are being chosen to fill important places of trust when their peculiar qualifications demonstrate their fitness.

One of the reasons why laws, ordinances and regulations of all sorts, from the tariff down, are so often ineffective or ridiculously opposite in operation to the intent of those who framed them is, that men of experience in the particular questions treated have not been utilized in their consideration. I had occasion, a few days ago, to examine one section of the tariff in order to give an opinion on the application of the law to certain facts, and found, to my astonishment, that, owing to certain ignorant use of terms with which any intelligent builder is perfectly familiar, and which he could have properly used, the very purpose of the law was defeated.

With the immense amount of construction work which our communities must always undertake, the practical help of builders, with their dearly bought experience, is needed, and our exchanges and associations must keep the public familiar with the men we have among us fitted to meet the public necessity.

I can remember perfectly how, when my father (who was one of Boston's old-time mechanics) was elected on the school committee, a great commotion was raised among certain people, who exclaimed, "What do we want of a mechanic on the school committee?" And I remember, with a great deal of satisfaction, how one level-headed old fellow on the board replied (probably with some recent occurrences in his mind), "We want a mechanic on the committee so that when we build another schoolhouse we won't have to tear it to pieces to get the stairs in, and won't have to pull up the drains because they pitch into the house instead of toward the sewer."

It is through association with each other that men and their abilities become known, and a good live exchange of builders in a city, an exchange which takes an interest in the affairs of the municipality and does not hesitate to let the public *know* that it is alive, will soon make a reputation for itself as one of the institutions of the place, and its members will be sought for when their special qualifications are needed for performance of public affairs.

Great works jeopardized because of incompetent men placed in authority have been common history for many years. This should be different; we should bring our men to the front, make them known, and say to the public, "When you have great practical work to be done don't fill up the commissions with lawyers and professional men,

but put a proper quota of mechanics on the board, men of experience in this character of work, and money and honor and reputation will be saved and the general interest prospered."

Already has the tide turned in our direction.

When that honest, fearless mayor of the great metropolis—himself a builder—looked about him for a man to put upon the aqueduct commission who could not only be trusted as an honest man, but because he was competent through his long experience in mechanical work to be in such a position, he came to this National Association and took one of its prominent officers, Mr. John J. Tucker, of New York. We all know that he made no mistake when he made this selection; and it should be our determination to encourage the following of this example by every means in our power, and one means is that which I have cited, namely, making our exchanges prominent features in our cities, making their influence felt, and by building up a proper respect for the individuals which form them, as citizens worthy to be recognized in everything that is undertaken.

This leads me very naturally to one important suggestion which I desire to make before closing: I am thoroughly convinced that the very best thing that builders' exchanges can do to advance their interests in the communities where they exist, and put their affairs upon a substantial basis, is to purchase a building or purchase land and build one suitable for their occupancy, and in which they can, perhaps, accommodate other interests connected with building.

My reasons for these are many, but I will only state a few of them.

In the first place, no body of men acting as a corporation for investment of money in real estate can begin to handle a piece of property to such good advantage as an exchange of builders who, while supporting their place of meeting for the transaction of business, and getting their full money's worth for every cent of their assessment, however large it may be (and here let me remark that but few exchanges in this country have yet educated themselves up to a proper point in yearly assessments), will have a good balance on hand every year to carry over to the building account, and almost before it seems possible the debt, if there is any, will be wiped out and the property owned, free and clear. It is a good business transaction and will place the exchange, in time, in command of money from rentals to apply to the many things it will always find opportunity of doing. Then, again, it gives you at once a standing and respectability in the community; it is an effective way of keeping in the eye of the public and establishes you as a landmark.

I was very much amused the other day, and pleased, too, when a builder from Connecticut who came to Boston for the purpose of consulting me upon exchange matters, told me that he thought he would test our standing in the city and find out whether we were widely known, so, as he stepped from the train he asked a policeman where our exchange was, and without a moment's hesitation the officer gave him a complete direction. Not content with this he purposely asked another and another of the men he met and everyone knew exactly where we are located; even the fruit venders upon street corners gave him correct answers, and he came to the conclusion that we were the best known of any of the societies in the city.

We own our building, gentlemen, and it is becoming more and more of a landmark every day. Philadelphia has followed our example, and I say to you all, "go and do likewise." If you are located in a prosperous and growing city, you cannot fail to make a good investment, and the property will largely increase in value on your hands.

In addition to these reasons, to own your building creates a sense of proprietorship among your members, and fills them with an interest in common which always seems to accompany the ownership of property. It is a good solidifier—a good anchor.

But I must not say more in this direction. Before closing I give you this word of caution about membership: Always consider quality more than quantity; do not strive for great numbers, but excellence in those you have as fellows. It is a safeguard both in times of peace and times of danger, and will facilitate the management of your affairs in whatever direction they may tend. With large numbers you must remember that the difficulties of management increase in geometrical proportion, and unless the quality is carefully watched, you may find yourselves handicapped by a superabundance of unthinking members, who will defeat your attempts to improve your opportunities to do any of the worthy and important things that the national body is today recommending.

Gentlemen, I have tried to make this address short, but have succeeded in making it too long, I fear, for my hearers. The fact of the matter is, there is no place to stop; it is all virgin ground, and there are constantly new and interesting specimens springing up which demand attention. I have tried to confine myself to general statements rather than to make them specific, for the reason that I should have been still more prolix had I attempted to take up too much in detail.

In a general way I might say that the opportunities for exchange or association work are being developed, materialized, put into definite statement now in the best and most effective way for the largest results by the national body. Let each filial association hold up the hands of the central association; do its level best to carry out the principles and practices approved by it, and it will not only be doing good service for its own needs, but will be a wholesome portion of the national body, and a strong link in the chain that binds us together.

ARCHITECT A. DRUIDING, Chicago, has prepared for his many clerical clients a book on church architecture, containing general rules and instructions in building churches and giving twenty churches, built or to be built, with general description, also perspective views of two proposed cathedrals. The preface is written by the very Rev. Dr. Otto Zardetti, V. G.

Masonry.*

BY JOHN J. TUCKER.

IT will not be my purpose to inflict upon you an attempt of any description of the dry matter of masonry as is usually compiled in statistical reports of engineers, so far as going into the question of tensile strength, and crushing weights, and all that sort of dry matter. I know from observation and experience how dry such subjects are to a body called together for the purpose of listening to something that may be expected to redound to their interest, comfort and edification.

The question of masonry, of course, presents itself as an old, dry subject, in any form that you look at it. Bricks and mortar are about the sum and substance of the whole thing, and in order to show you that there is a beginning, I will simply go through the form that my predecessors have to show you that there was a beginning, and how they have improved by time, and how they have not improved by time.

The trade of a mason is probably one of if not the oldest manual trade followed by mankind, allied, as it is, so closely to his wants. Being of such antiquity, it has two fields, the historical and mechanical, and we will take them up in that order.

The first instinct of all creatures of animal life is the obtaining of food; that being satisfied, the next is that of securing shelter. Before man exercised his faculty of invention as an architect, he may have crept into hollow trees or inhabited caves as tenants in common with the beasts. This, however, was not always sufficient protection from the force of the tempest or the rigor of the climate, and better security was required.

The natural tendency of all is to turn to that which is nearest at hand and try and make it serve our purpose; consequently we find that the earliest histories give us as facts that loose stones were laid up, forming a rough wall, and covered over on the top by branches of trees. In this way a rude habitation was formed, and from this beginning have formed the marvelous edifices that now dot the face of the world as evidences of the growth of man in advancement and civilization. In many localities, however, stones were not to be had, or it was impossible to shape them into the forms desired. This led to the finding of a substitute, and was the cause of the making of what we know today as brick. A convenient and enduring material was obtained, and from the only authentic record of this period of the world's history, the bible, we learn that it was the principal material employed in the construction of the city and Tower of Babel.

It is supposed that the city of Babylon occupied the same site as the Tower of Babel. Strengthened and fortified by successive sovereigns, it became one of the wonders of the world. Historians say the walls surrounding the city were 360 feet high, 87 feet thick, and 60 miles long. We are apt to be somewhat incredulous about the measurements, yet when so many stupendous monuments remain to demonstrate the power and skill of these ancients, we know not where to fix the bounds of our belief.

The site of this great city has been identified. Sir Robert Kerr Porter, who visited these ruins some years ago, in speaking of the Temple of Belus, one of the most prominent structures in the city before its destruction, says that on the north side of the ruin there are large masses of fine and solid brickwork, built of kiln-burned brick, united by a calcareous cement.

The great antiquity of this work conclusively proves that kiln-burned brick are of very ancient date. Those first made were sun-dried, but being imperfect and not of sufficient durability, artificial burning was employed, and the quality of the material and labor is best appreciated when you say that the work is standing today, over three thousand years after completion. Climatic influences undoubtedly have a great deal to do with its preservation, but considering its great age, we cannot but admire the skill of a people that we of today regard as little better than barbarians.

From Asia let us turn to Africa, and here we find the largest structure in the world and, perhaps, the largest ever constructed. I speak of the Pyramid of Cheops; it is the greatest mass of material

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* Paper read before the National Association of Builders at Philadelphia, February 14, 1889. Revised by the author for publication in THE INLAND ARCHITECT.

which man has ever placed together to form a single building, as far as is known.

The material employed is granite and limestone, and in many cases the stones are so nicely cut—apparently no mortar has been used for the joints, and the space is so small that you can hardly detect it with the eye. How this masonry was constructed, how these great stones were lifted to their position, etc., have puzzled engineers for years, and it is not my province to discuss; suffice it to say, that there it is, an everlasting monument of what the mechanics of those times could do; and, taking everything into consideration, I doubt if we have made any great amount of progress in perfecting material, as far as it is artificial, since that time.

One thing is particularly noticeable in looking over these relics of ancient times, and that is that all that is left of them is masonry. We do not find that they employed metal to any extent. We have abundant evidences that they were workers in metal in divers directions and had attained great proficiency, but for construction purposes it was not used.

Leaving the remote periods, we will advance chronologically, and the next most important is the Roman about the time of the Christian Era. Of this period evidence abounds of the high degree of perfection that masonry had obtained, and, in fact, some of their structures, such as bridges in use today, show a superior quality of workmanship and knowledge of construction and material. The Roman Empire at this time practically controlled the civilized world, and its wealth was concentrated in the hands of the government and nobility. In all branches of learning they were educated to the highest degree. In architecture and sculpture they have left us relics that have always been looked upon as models of the highest degree of perfection.

In chemistry and physics they were equally well learned, and were continually experimenting. In the field of building materials national pride was very great, and it was their highest ambition to leave monuments in the form of structures that would last for ages to come.

Consequently, we find their cements and mortars of a very high quality, as they fully realized that the building material must be of equal endurance to that of the material employed, be it stone or brick.

After the fall of the Roman Empire and the absorption of western Europe by the barbarian tribes of the East and of Asia, we find a rapid decline in the character and quality of the mechanical arts. As I have said, the Romans were the most highly cultivated and learned of all the people of their time. Their conquerors were just the reverse; in fact, as far as civilization was concerned, they knew absolutely nothing, and of the mechanical arts their knowledge was extremely slight. The old saying is that necessity is the mother of invention, but, unfortunately, in their case the necessity did not exist; consequently we find that while under the Romans the work was of a most perfect character, even to the minutest detail; under the dominating influences of these savages, crudity and massiveness soon became the rule, and the finer qualities of the work, as of the people, were soon obliterated.

Without schools and instruction, ignorance in a few generations had full sway, and the arts and sciences, so fully developed in the past, soon drifted into oblivion, and were forgotten by all but a very few.

In masonry this is very noticeable; instead of the fine lines and exact workmanship we now find incongruous and irregular masses of stone, and to obtain required strength quantity instead of quality is employed.

This, to a certain extent, as I have said, was due to the very general lack of education of the masses. The learning was almost exclusively in the hands of the priesthood, and we find it best exemplified in the buildings remaining of that period. The cathedrals and religious edifices were models of beauty and elegance, not only in their architecture, but in their construction.

Beyond the ecclesiastical, however, we find nothing, and the presumption is that the mechanical trades were taught and followed to a certain extent in the priesthood itself, as by this means only were they enabled to have a body of workmen capable of erecting such enduring monuments.

Architectural ability was not sufficient, however, to insure their construction; mechanical was as necessary, and finding works of this class to be the only ones showing these qualities, we are forced to the belief that it was by their own hands these buildings were erected.

This condition of affairs, however, could not go on forever; population was increasing to such a degree that the buildings to be erected were too numerous to be constructed by their own hands, and laymen were taught the different branches of masonry.

It must be borne in mind that at this time buildings were all masonry, even to the roofs, which were mostly formed by arches, and wood was employed for ornament and interior fittings only.

The nature of the trade of a mason forced upon him one very great difference to all other mechanics. All the usual trades were local and the exercise of them confined to the locality where the craftsman resided; the masons, on the contrary, were forced to go where a great work was being executed. His work never came to him, nor could it be carried to his house, he was forced to go to it. And when a great work was to be erected in any town which was beyond the strength of those of the place to undertake, masons were sent for and came from all the neighboring districts to obtain employment.

At a time when education was almost unknown among the laity, and not one in a thousand among the masons could read or write, it evidently was essential that some expedient should be hit upon by which a mason traveling to his work, or in search of the same, might claim the assistance of his brother masons on the road, and at the same time enable him to take his proper rank among the mechanics in a place where he was a stranger, without a tedious examination or a practical proof of his skill. For this purpose a set of secret signs was invented which enabled all masons to recognize one another as such, and by which each man could make his rank known to those of similar grade without further trouble than a manual sign or the utterance of a recognized password.

Other trades had something of the same sort, but it never was necessary for them to carry it to the same extent, being for the most part resident in the same place and personally known to each other.

These masons who from these circumstances became so completely organized, were men skilled in the arts of hewing and setting stone, and acquainted with all recent inventions and improvements connected with their profession. Their traveling from one country to another gave them opportunities to, and they did become the best learned of all the mechanics of their time, and capable of carrying on any work that might be intrusted to their care, though they never seemed to have attempted to exercise their calling except under the guidance of some superior personage, either a bishop, abbot, or accomplished layman. As a class they were exempt from many of the exactions of the feudal laws of the time, and to this day we use a term undoubtedly descended from those times to designate a thorough workman, namely, that of journeyman, or one who is fitted to journey, as a distinction from an apprentice or apprendis, one who learns.

What connection historically these mechanics may bear to the order known as the Free Masons, I am unable to say, but have no doubt, if carefully looked into, a very intimate one will be found to exist. The strong bond of union among the workmen had a great influence on their productions; new methods were tried, and, if successful, retained, and the best results in different countries were soon known among the rest, as the buildings show for themselves, and the entire influence was toward improvement in a much greater degree than is shown in the other mechanical trades. And although this union, if I may call it so, was probably the strongest ever existing among mechanical workers, I have not found any mention made by any author of its strength being used to coerce an employer into paying higher wages or giving shorter hours. Conspiracy laws in those days were very severe, and perhaps in that fact may be the solution.

Up to the beginning of the eleventh century we find the majority of fine edifices partake more or less of the religious order. The devotees had most magnificent structures for worship and retirement, but the secular portion of the community, even to the very highest, had been comparatively very poorly housed. As civilization advanced wealth accumulated, and we find palaces for sovereignty and nobility now appearing on a scale of magnificence and immensity not before existing.

Venice at this time had acquired great wealth, and among its people were some of the richest in all Europe; wishing to show evidence of that wealth to the world they built some of the finest public and private buildings in Europe. With practically no foundation and directly in the water itself, they planted immense beds of concrete; on these stone were placed, and the sub-structure gradually brought above the water level; on these piers and walls were erected edifices that today rank among the first. How can we limit our praise of the workmanship when we consider that these buildings are standing today, six centuries since their construction, and in many cases with no signs of settlement and little decay.

An examination of the brickwork of about the fourteenth century will show a marked difference from that of former times. Up to this time walls had been built of either brick or stone, the use of both in the same wall but very rarely employed, and in the brickwork we find a very marked irregularity in the joints, in some places thick, others thin, and all showing an individuality rather than harmony.

From this time, however, we find the brickwork showing a uniformity, and it is evident some regulator has been at work, and although there don't seem to be any positive recorded evidence of it the work speaks for itself, and a line was devised to keep the courses of brick regular, and even at the same time compelling the workman to use a uniform joint.

The reason of this is evident from the fact that we commence to find brick used as a backing to stone, and it was desirable that the joints of the backing should be level with the stone joints, for every here and there we find deeper stone penetrating the full thickness of the wall. We find this at first in districts where good stone was scarce, and a substitute was a necessity; undoubtedly the first to employ did so with distrust, but it proving satisfactory it was frequently employed, and from being an auxiliary it has grown until in some cases it constitutes the major portion of the wall, the stone being nothing more than a veneer to the exterior face, the weight-bearing portion being entirely of brick.

From this time up to the present the progress of masonry as an art has been very slow, the advancement being in the application occasioned by the varied wants of an improved and advanced civilization. The attention being turned more to the interior, for ages the inside of walls had been finished by the stone of the wall itself, and if of brick by a stucco which was painted or hung with tapestry, etc., in some parts wood being used. Plastering as known among us was not generally used until many years later, and then only on the walls, the idea of furring and lathing not coming into existence until comparatively of recent years. Interior partitions not part of the structural formation were not known, the immense apartments being divided by heavy draperies. This brief review shows us one indisputable fact, and it is that the general principles of masonry were as well known two thousand years ago as now, although neglected and not observed for a time, have gradually returned, and we are following in the footsteps of the ancients, except in so far as the wants of the people of another civilization may differ.

Let us now turn to the mechanical and examine the conditions and requirements which must be fulfilled in order to secure strong and lasting results. Masonry is capable of many and varied applications, and when honestly done will rarely fail to meet the most

exacting requirements, but as in everything else, all depends upon the observance of the laws governing its combinations. While it is capable of sustaining a load of many tons to the cubic foot, its maximum strength is only obtained when all the conditions are faithfully carried out. The joints must be thoroughly and carefully filled, and if of brick they must be well wet before laid; even then variations will occur according to the quality of the material employed.

Another important element in the strength of masonry walls is the thickness, and everything else being equal the heavier the wall the greater the crushing strength per cubic foot, one of the principal reasons being that the slower evaporation of the moisture not producing the porosity formed in a thinner wall.

In masonry, as in a chain, its strength is measured by its weakest part, and no matter how strong individually the component parts may be, if they are not put together in such a way as to unite that strength in a body the result will be unsatisfactory. In placing small bodies in such a manner as to form a large mass the great secret of success is the bonding, or that particular arrangement which shall make each particle dependent upon its neighbor in such a way as to make the whole mass act as one body. After the bonding the next most important is the uniting body by which each part is held fast to its neighbor, or in other words, the mortar.

The basis of all mortar used today is lime, and there are two kinds, common and hydraulic or cement. These materials are the result of calcination of rock more or less composed of carbonate of lime, the carbonic acid being driven off by the heat and leaving the lime in the form of an oxide. The rock used for making common lime is generally almost pure carbonate, while that for the hydraulic is what is called argillaceous, that is, less proportion of lime and a percentage of aluminum or clay and silica or quartz. The first, when mixed with sand and water, will harden by exposure to the air, by the evaporation of the water and a chemical change by which the lime becomes a carbonate by absorption of carbonic acid gas from the atmosphere.

In the hydraulic we have a material which will set or harden without the admixture of any other material than water, and will do so either in the air or when surrounded by water. We will take them up in the order I have named. The common lime is made into mortar by first slacking or dissolving it with water, and then mixing with a certain proportion of sand, which will vary with the purpose for which it is to be used. The slacking of the lime is of the greatest importance, and may determine the quality of the mortar. Care should be taken to thoroughly dissolve all the particles, and the more completely this is done the better. No more water should be used than necessary, as any surplus will injure its quality, being so much additional to be evaporated, and leaving the mortar porous and of less strength. The longer the slacked lime can be kept before using, providing air is kept from it, the stronger mortar it will make. The ancients thoroughly understood this quality, as Vicat and other authorities on mortars say that the Romans frequently kept the slacked lime three or four years before using, and their work proves the wisdom of the course. Lime is granular, and when water is brought in contact with it the chemical action is exceedingly rapid, and heat is generated; this turns the water into steam, and particles will surround themselves with air, which acts as a wall against the water, and will remain so for some time; by keeping it, therefore, we more completely dissolve these particles.

Circumstances today, however, will not permit such delay, owing to the rapid manner we are called upon to perform our work. We are compelled to hastily slack, mix our mortar, and use it in the building, and the action that should go on before use now has to take place in the wall itself to a great extent. Next to the slacking, the most important part is mixing with the sand, which should be as gritty or sharp as possible, so as to offer irregularity for the lime to adhere to. For many years it was supposed that the more lime used the better the quality of the mortar, but Vicat, whom I have just spoken of, proves this to be an error. The lime is the uniting body in the mixture, and is not of equal tensile strength to the sand, and all that should be required of it is to thoroughly unite the particles together in a solid mass. The chemical change by which the mortar hardens is the gradual change from the hydrate of lime, which is its condition when it goes in the wall, to a carbonate, which it becomes by the giving off of the water and absorption of carbonic acid gas from the atmosphere. In this form it is a minute crystal, and in the crystallization it adheres most tenaciously to the nearest foreign substance, which is the sand and the material of which the wall is composed, thereby uniting them firmly together.

In the hydraulic limes or cement we have a slightly different condition of affairs. The lime is not pure as in the other; it is mixed with silica and aluminum, and when the water is applied, instead of forming a hydrate it commences to unite with the silicic acid and silicates of lime and aluminum are the result, which rapidly crystallize and become extremely hard in a comparatively short time.

Having seen what the results are of mixing these materials we must not assume, however, that the mere putting of them together will make a good mortar. They must be thoroughly mingled and blended with each other and all the components thoroughly incorporated in the mass so that the crystallization following may be equally great in all parts of the body. I think in many cases where mortars have not proven satisfactory and the quality of the material been questioned, the real difficulty has been an insufficiency of mixture or turning of the bed. We have seen that our bonding is of the highest importance for the securing of stable work, then our uniting material to hold the parts in position, where next should we turn our attention but to the very beginning—to our foundations. If these are of insufficient strength the entire structure is imperiled.

Circumstances, of course, compel various expedients to suit the particular case. If the ground is of a treacherous nature, piling may be the only thing; but if that is not necessary, I am unqualifiedly in favor of concrete as a base over any other. In this we have a material that we can mold at our will, make it as great or small as desired, a homogeneous mass after setting, and is or should be equally strong in all parts, there being no joints to weaken its resistance. Its formation, however, is not as fully understood as it should be. It is the impression among many that the more cement used, the better the concrete. This is an error precisely the same as that regarding lime in mortar. The cement is, as in the lime mortar, the uniting body only—not the base. The tensile strength of the broken stone and gravel mixed with it is greater than the pure cement, and so as we want the greatest strength possible, we should use sufficient cement to thoroughly unite the stone and gravel in a compact mass only. Mixing is a very important matter, also, and it should at first be done with all the materials perfectly dry; after that is done, add the water and turn over again until no dry particles are to be seen.

After placing in the trench the mass should be tamped thoroughly, to insure solidity and work out the surplus water which will not only retard the setting, but by evaporation leave the mass more or less porous and weakened. If we have protected the structure as far as possible by good bonding, good mortars and good foundations, the exterior has only one enemy, and that is time. The interior, however, has always one ready, and we must prepare for that; it is fire!

How can we best guard against its ravages? Masonry is, we might say, indestructible so far as fire is concerned; that is, it will not burn, and it must be employed as far as possible to protect the weaker parts. In a comparatively few years we have made great advances in this particular line. Hollow clay blocks for floors and partitions are a great advance over the solid brick formerly used, and by lessening the weight have enabled us to erect lighter walls, but there is still too much unnecessary weight, and something still lighter, but fireproof, must be devised. In what direction it will be found I am unable to say, but I am convinced that it will come, and the future will bear fruit in a material for our use that will be far superior to anything now dreamed of.

Let this question be solved, so that our buildings can be made absolutely fireproof—at the same time not unnecessarily massive—and I shall consider that we have arrived at a degree of perfection in masonry not before equaled in the history of the world, and it is a question if we are not in that position today.

In conclusion, let me say that, although it is a very common statement that the works of modern times are and will not be as enduring as those of ancient date, I do not agree with those who make it. The great durability and stability of the works of the ancients is due, first, to their massiveness; second, to their slow and careful construction, in which every part became so thoroughly solidified with its neighbor that at completion the mass was, you might say, a single stone; and thirdly, their equable climate not subjecting them to the expansion and contraction a more rigorous one would entail.

Notwithstanding statements to the contrary by many, I do not believe they had any better materials than we; our mortars and cements are as good as theirs, and the mechanics of today have never had a superior, and should occasion arise, I am confident we can erect monuments that will stand for ages to come, and be an everlasting proof, I might say, that the civilization of the nineteenth century can produce masonry equal to that of any previous period in the history of the world.

The Metric System.*

BY GEORGE EASTBURN, PHILADELPHIA.

Knox's House, Edinburgh.

THE true value of any piece of mechanism depends chiefly upon two things, namely, first, its efficiency to do the work intended to be done in the best possible manner, and secondly, the consumption of the least possible time in the performance of said work; in other words, quality of work and consumption of time are the two all-important factors that enter into the calculation in determining the success of all industrial operations.

Previous to the application of steam and electricity to the development of civilization, international communication and commercial intercourse were so slow and so limited, that the means by which

*Paper read before the third annual convention of the National Association of Builders at Philadelphia, February 13, 1889.

quantity and cost of articles of traffic were ascertained, was a matter of secondary importance; but, in this age of steam transportation and electrical communication, when we must do *in a day* an amount of work at which our grandfathers would have been contentedly engaged a month; when a brisk commerce is being carried on with almost every nation of the earth, the mode of making calculations in business, and of representing the most common terms for expressing quantity in language that can be universally understood throughout the civilized world, becomes a matter of most serious concern throughout the whole sphere of commercial and industrial operations, there is not a single piece of work executed that has not, in some way or other, the necessity of the use of some means of measurement connected with it. The grocer must use his weights and measures of capacity in disposing of his sugar, tea and coffee, his molasses, fruits, and vegetables; the dealer in dry goods must use his measures of length in selling his muslins, cloths, silks, and velvets; the physicist and the chemist bring into constant requisition delicate weights and measures in their investigations; manufacturers, builders, and architects have measures and measurements in their minds almost continually; in fact, in all business calculations, quantity, indicated by measures of some kind or other, interposes the greatest obstacle in finding cost.

As there is such a need for weights and measures, in order to render intercourse between man and man possible, it is of the highest importance that the system in use should be the best that can be devised. As weights and measures serve only as a piece of mechanism for ascertaining quantity in some particular phase of business or investigation, unquestionably that system of weights and measures is the best, *per se*, which is best adapted for the easy and rapid calculation of quantities in which are involved lines, surfaces and volumes. The system which supplies these requisites is one in which the basic unit linear measure, or some even division, or some multiple of the same, is taken as the base of the unit for the computation of area, of capacity and of weight, and to facilitate calculation the notation is decimal.

This preface introduces to you my subject entitled "The Metric System," which I propose to treat under the four following general divisions:

I. The objections to the measures now in use in the United States.

II. The advantages of the metric system for the use of measurements.

III. What has been done toward the universal adoption of the system.

IV. What should we, the citizens of the United States, do to secure its exclusive use at an early date in our country?

Under the first general head I present the five following named objections:

First. Entire absence of any linear basis upon which quantities of capacities and of weight can be scientifically computed.

Second. Multiplicity of names.

Third. Differenees of values in units of the same name.

Fourth. Irregularity of the notation.

Fifth. Dissimilarity to the weights and measures of any other nation.

To anyone acquainted with the metric system, it is evident that one of the most valuable features of a system of weights and measures is a common linear basis from which areas, volumes, capacities and weights may be easily calculated. In the weights and measures now in use, having given the linear dimensions of a volume, there is no connecting commensurable unit by means of which the capacity and the weight may be directly found. The consequence of this in commensurability is the necessity and inconvenience of first calculating from the linear dimensions given, the cubical contents of the capacity or volume and then by a long process of division or multiplication, the capacity or weight is found in the denomination desired.

Secondly, the multiplicity of names used to designate the units found in the various measures, constitute a very objectionable feature. In our best arithmetics there are not less than twenty different names given to units of length alone, ten to units of surface, seven to units of solidity, fifteen to units of capacity, ten to units of weight, making sixty-two arbitrary names of units to designate measurements of lines, areas, volumes, capacities and weights alone. Such a diversified, meaningless, heterogeneous nomenclature as is found in naming the units used in our tables of weights and measures is enough to discourage any ordinary student in the hope of ever mastering them, and to cause the master acting teacher to feel justified in excusing his pupils from a thorough knowledge of the tables and of their relations to one another.

The third objection that I offer to our weights and measures is that several of the units bearing the same name do not represent the same quantity. Let us first turn our attention to the weights. There are, in practical use, in our country today, four different sets of weights, namely, the troy, the apothecaries, the avoirdupois and the diamond.

The unit, by which the values of the weights of the other denominations are compared, is the troy-grain. Of the denominations of weights the values of whose units differ, I mention the ounce, the pound, the hundred-weight and the ton. The troy ounce contains 480 grains and the avoirdupois ounce, 437½ grains. There are 12 ounces in a pound troy, and 16 ounces in a pound avoirdupois. By multiplying 480 grains by 12 we obtain 5,760 grains, in the troy pound, and by multiplying 437½ grains by 16 we obtain 7,000 grains in the avoirdupois pound; thus results the peculiar fact that an ounce of gold weighs 42½ grains more than an ounce of feathers, but that a pound of feathers weighs 1,240 grains more than a pound of gold. The ordinary hundred-weight contains 100 pounds avoirdupois, yet there is another hundred-weight used in certain specified cases which contains 112 pounds, and the two tons (each having in it 20 hundred-weight of its own kind) bear the same ratio to each other as the hundred-weights.

The coal dealer within the city limits of Philadelphia is required to furnish 2,240 pounds to the ton, while the dealer just beyond the city limits supplies his customer with 2,000 pounds to the ton.

Let us now consider for a few moments the irregularities in the units of capacities having the same name. The measures of capacity known under the respective names of wine, ale or milk, and dry, have each three denominations, the pint, the quart, and the gallon, of the same name, yet no two of these measures of the same name contain the same capacity. Taking the cubic inch as the unit of comparison, the wine gallon contains 231 cubic inches; the ale or milk, 282 cubic inches, and the dry, 268.8 cubic inches; and dividing these numbers respectively by 4 and then by 2, we obtain the proportionate number of cubic inches for the quart and pint of each of the measures. In the absence of any legal provision requiring the testing and the sealing of weights and measures, a man needs but little knowledge of the tricks of trade to see the opportunities for practicing deceit upon the unwary customer. In fact this diversity of capacity of units of the same name, and the appropriation of special titles to certain measures, open the way to an unconcealed injustice to a large class of producers of one of our most important daily necessities. I refer to the dairymen who reside along the lines of railroad communication with the city of Philadelphia. When the milk dealer of this city contracts with the dairyman for the milk, he demands as his rights that he shall receive as a quart the milk quart of 70½ cubic inches; then follows a mode of measurement, which makes the transaction as unjust, for after the milk has been brought to the city the consumer is not allowed the privilege of buying the article as *milk* or ale, but it has been so changed that, so far as measurement is concerned, it is dealt out as wine, or 57¾ cubic inches to the quart.

The fourth objection which I bring to your notice, is the irregularity of notation. This is exhibited in its perfection in the tables of the linear and surface measures, in the former of which the factors in reductions are 12, 3, 5½ and 320, and in the latter, 144, 9, 30¼, 160 and 640. In fact, this irregularity of notation, combined with the diversified variety of the tables of weights and measures, constitutes, in an educational point of view, the most forcible objection to them.

The difficulty of learning such a mass of arbitrary names, and of remembering so many irregular uncorrelated numbers, is so great, that it takes months to acquire them, and constant reviews to retain them, and the necessity of subjecting the young to so much practice in order to secure proficiency in the performance of the various forms of reduction and a readiness in the manipulations of compound numbers, so multiplies the time and work in arithmetical instruction in the schoolroom that arithmetic must be taught continuously throughout a school course of seven or eight years, while, if the metric system were as thoroughly established in the place of our weights and measures as the use of our system of money is, all necessary practical arithmetic could be taught in a few months, and from *one* to *two* years' time would be saved in a boy's school life, and a great amount of mental vigor now wasted in solving the intricacies of compound numbers could be devoted to the more pleasant occupation of investigating some useful science or of enjoying the beauties of classics.

In considering my fifth and final objection I wish to correct a common mistake. Most people think that our measures and those of England are identical. Such is not the fact. While their names are the same their values differ widely. As England is the only country which, it is claimed, has weights and measures similar to ours, if I prove that these are unlike, my objection must be accepted as valid. Let us compare the values of some of the measures used in the two countries. Taking the "Encyclopedia Britannica" as authority, the United States inch = 1.000049 British inches. The United States wine gallon = .83 British gallon, containing 277.27 cubic inches, which is used for all substances, both dry and liquid, and which is one-eighth of the imperial bushel of 2218.19 cubic inches.

Our bushel contains 2,150.42 cubic inches, hence the United States bushel = .97 British bushels; or, putting these statements in a different form, 83 British gallons = 100 United States gallons, and 97 British bushels = 100 United States bushels. The British hundred-weight on a ton are 12 per cent heavier than weights of the same name in our country. The British gallon, quart and pint do not correspond with those of any one of our three measures. They are 20 per cent greater than those of our wine measure, 3 per cent greater than those of our dry measure, and 1.6 per cent less than those of our ale measure.

No further argument is needed to show that our weights and measures are unlike those of any other country, and it seems to me that their objectionable features have been portrayed in such a light that every earnest advocate of progress and reform should be ready to cry out, "Cannot something more convenient be found to be substituted for these irrational cumbersome weights and measures?" I can assure you it can. It has already been found. It is not new. It has so popularized itself by its own intrinsic merits, that it is destined not many years hence to be the universal means for the computation of all measurements. This great invention is the metric system, which I now proceed to explain.

The metric system stands in the strongest contrast to the weights and measures in general use in our country. Its conception was the result of an earnest desire to establish for the whole civilized world a uniform, permanent and universal system of weights and measures.

In examining the second general division of my subject, namely: "The advantages of the metric system for the uses of measurements," I shall strive to show these advantages prominently consist:

I.—In the foundation of the system upon an invariable standard linear measure as a basis.

II.—In the facility in which the units of surface, capacity, solidity and weight are derived from this linear basis.

III.—In the uniformity, the significance and the simplicity of the nomenclature.

IV.—In having only one table of linear measure, one of capacity, and one of weight.

V.—In the application of decimal notation to all divisions and multiples of the basic units of weights and measures.

The metric system of weights and measures is so named because the fundamental linear base for the calculation of all the denominations of measures is the *meter*. The word *meter* etymologically considered means in the various southern European languages *a measure*, hence it is an appropriate name to give to that measure which stands as the invariable standard linear unit upon which all other measures of whatsoever kind, are to be dependent, and the system based upon it is as appropriately entitled the "Metric System."

The fixed length of this *meter* was obtained from a most careful computation of the length of the distance from the equator of the earth to the north pole along the meridian passing through the city of Paris. During the last decade of the eighteenth century that feat of geodesy, which furnishes the basis of the metric system, was accomplished by the ablest mathematical talent obtainable at that time. The length of the said distance having been determined, in order to obtain from it a convenient measure as a basis for practical use, it was divided into 10,000,000 equal parts; hence, the *meter* is a ten-millionth part of the distance *from* the equator to the poles, or a forty-millionth part of the polar circumference of the earth. The source from which this unit of measurement was taken suggests that it is as invariable and permanent as the earth itself.

Having described the base upon which the foundation of the metric system rests, I will explain the manner in which the units of the other measures are obtained, and show how each is dependent upon some decimal division or decimal multiple of this fundamental linear base, the meter.

The unit for surface is the *are*, which is represented by a square whose side is 10 *meters*; the unit for capacity is the *liter*, which is a cube whose rectangular linear measurements are one-tenth of a meter, the unit for solidity is the *stere*, which is a cubic meter; and the unit for weight is the *gram*, which is the weight of a cube of distilled water, whose side is the hundredth part of a meter.

A slight examination of the relations mentioned above will reveal the readiness by which the quantity of surface, capacity, solidity or weight may be found when the linear dimensions of quantities are given. That is, that area in square tens of meters equals the number of areas; capacity in cubic tenths of a meter equals the number of liters; solidity in cubic meter equals the number of steres; and volume in cubic hundredths of a meter equals the number of grams of water, and to find the weight of any substance, all that is necessary is to find its contents in cubic hundredths of a meter and multiply by its gravity, and the product is the weight of the substance in grams. I now ask your attention to the uniformity, significance, and simplicity of the nomenclature of this system.

Each of the above named units has its decimal divisions and decimal multiples, the value of which are indicated by uniform and significant prefixes, placed before the names of the units of the measures of the different kinds of quantity. The prefixes donating the decimal divisions, beginning with the smallest, are milli, meaning a thousandth; centi meaning a tenth.

No American, certainly, should find fault with these, for, besides their simplicity in representing divisions on the basic units of quantities to the thousandth part, they are already familiar to us in the use of the money of the United States in the terms mills, cents and dimes, which are employed to represent the thousandth, the hundredth and the tenth part of the unit of our money, the dollar.

The prefixes denoting the decimal multiples are, deka, meaning ten; hekto, meaning hundredth; and kilo, meaning thousand.

All the denominations of measures of length, surface, capacity, solidity and weight can be represented by the fine units and these six prefixes, with the additional term *ton*, so that only twelve separate names are required, which exhibits a wonderful simplicity of nomenclature when compared with the names of the measures now used, since the names of units of length alone are nearly double this number. In practice it is not always found necessary to use all of these prefixes to indicate divisions and multiples. Thus, in computing area of land it is useless to have a denomination less than certiare or greater than hektare, hence the tables of measures are arranged in decimal uniformity, but only such divisions and multiples are introduced as are required in practical computations. The only tables of weights and measures absolutely needed are five in number, and they may be stated as follows:

MEASURES OF LENGTH.
A Millimeter = .001 of a meter.
A Centimeter = .01 of a meter.
A Decimeter = .1 of a meter.
A Meter is the unit of length.
A Dekameter = 10 meters.
A Hektometer = 100 meters.
A Kilometer = 1000 meters.

MEASURES OF SURFACE.
A Certiare = .01 of an are.
A Deciare = .01 of an are.
The *are* is the unit of area.
A Dekare = 10 ares.
A Hektare = 100 ares.

MEASURES OF SOLIDITY.
A Millistere = .001 of a stere.
A Centistere = .01 of a stere.
The Stere is the unit of solidity.

MEASURES OF CAPACITY.
A Milliter = .001 of a liter.
A Centiliter = .01 of a liter.
A Deciliter = .1 of a liter.
The liter is the unit of capacity.
A Dekaliter = 10 liters.
A Hektoliter = 100 liters.
A Kiloliter = 1000 liters.

TABLES OF WEIGHT.
A Milligram = .001 of a gram.
A Centigram = .01 of a gram.
A Decigram = .1 of a gram.
The gram is the unit of weight.
A Dekagram = 10 grams.
A Hektogram = 100 grams.
A Kilogram = 1000 grams.
A Ton = 1000 kilograms.

As the above classification indicates only one table for each kind of quantity used, which is far preferable to the measures now in vogue, which, as I have already stated, have four different tables of length, three of capacity and four of weight, the fifth and last superior feature of the metric system to which I will refer is the calculable advantage of a decimal notation. When treating of the objections to the measures now in use, I showed what laborious work was required in making reductions therein. Reductions in metric calculation, on the other hand, are effected by merely moving the decimal point or prefixing or affixing ciphers; for instance, in reducing measures of length from the lowest to the highest denominations in the two systems, that is, to change inches to miles, it is necessary to divide successively by 1, 2, 3, 5½ and 320, while to reduce millimeters, the unit of which is only about $\frac{1}{25}$ of an inch in length, to kilometers, the unit of which is a little more than .6 of a mile, and is used in the metric system to indicate such distances as we represent by the mile, all that is required is to move the decimal point six places to the left. While the ease with which this latter reduction is made is sufficient to show the great superiority of the decimal notation, it is not the only advantage of the metric system of lengths over our linear measure, for the ratio in the difference of length between the millimeter and the kilometer is 1478 per cent greater than the difference in length between the inch and the mile; the mile containing 63,360 inches while the kilometer contains 1,000,000 millimeters. As previously stated, the system of measures already explained furnishes means for the measurement of all commodities of traffic, but in practice it is found, in manipulating with small quantities, as the chemist and the druggist are continually required to do, that tables of surface and cubic measures composed of the squares and cubes of linear denominations are more convenient for use than those in which the *are* and stere are the respective units. Here again, the advantage of a decimal notation is forcibly shown. As the square millimeter is an almost inappreciable quantity, it being the .001 square centimeter (show surface) and square millimeters are hundredths of square centimeters, the table of surface measure commences with square centimeters, and is written as follows:

100 square centimeters ..... 1 square dekameter.
100 square dekameters ..... 1 square millimeter.
100 square millimeters ..... 1 square dekameter.

As this is a table for areas, and as similar areas are to each other as the squares of their like linear dimensions, the number of units in each preceding denomination is the square of 10 or 100 times the number of units in the succeeding one.

As cubic millimeters are so small, each being the .001 of a cubic centimeter, and their value is indicated in thousandths of a cubic centimeter, the table of cubic measure is thus written:

1,000 cubic centimeters ..... 1 cubic dekameter.
1,000 cubic dekameters ..... 1 cubic millimeter.

As similar capacities and solids are to each other as the cubes of their like linear dimensions, the number of units in each preceding denomination is the cube of ten or one thousand times the number of units in the succeeding one. The reductions by these tables are made with as great facility as by the tables in which the progression is by the simply decimal notation.

In square measure the progression from one denomination to the next higher is by the square of the decimal or the centesimal notation, and hence to change square centimeters to square decimeters the quantity must be divided by one hundred, which is done by moving the decimal point two places to the left. In like manner in cubic measure the progression is by the cube of the decimal or the millesimal notation, and to change any cubic denomination to a higher or lower denomination the division or multiplier must be one thousand, or the decimal point must be moved three places for a change to each successive denomination.

There is also an incidental advantage connected with the practical use of the metric system, which is so important that I desire to present it with double emphasis.

This is the fruitfulness of the system in furnishing smaller and larger easily controvertible and suitable units of measurements for every conceivable kind of industry. As units of length suited to each particular purpose, and being either the standard base of linear measure itself or some decimal division or decimal multiple of the same, we have the meter for the manufacturer of textile fabrics, the dry-goods merchant and the builder; the decimeter for the horse-jockey; the centimeter for the manufacturer of all kinds of culinary utensils, the shoemaker, the tailor, the brickmaker, the plumber, the mechanical engineer, the architect, and the worker in metals; the millimeter for the physicist in making his delicate calculations; the dekameter for the surveyor and the civil engineer, and the kilometer for the itinerary. The series of weights used in the metric system also furnishes a suitable unit for weighing every article which must be handled in any business or profession. The gram is the most appropriate unit imaginable for the use of the chemist and the druggist; the kilogram is especially adapted to trade in articles of ordinary daily consumption, and the ton of 1,000 kilograms meets the demands of dealers in coal, iron and other gross commodities.

The other measures are no less prolific sources for furnishing fitting units for different purposes, but enough has been said to show the wonderful adaptability of the metric system to the uses of mankind.

I have already so nearly consumed the time allotted to me in considering the constitution of the two systems of weights and measures that I shall have to present what I have to say under the two heads yet to be treated in the most condensed form.

In the first place a verified standard meter, made of an invariable and indestructible alloy of platinum and iridium, is so securely preserved that its destruction is beyond present human possibility.

In the second place an International Metrological Bureau, composed of representatives from each of the nations adopting the metric

system, has the custody of this prototype meter, and directs the manufacture of attested copies of said meter, to be supplied to all nations and associations which may wish them, so that accuracy and uniformity in all measures distributed throughout the world are secured.

Having stated that a verified standard meter is in safe-deposit and that the production of authenticated copies thereof is provided for, let us see with what favor this metric system has met at the hands of civilized nations.

By government authority the use of the metric system is now obligatory in the following named countries :

In Europe — Austro-Hungary, Belgium, France, Germany, Greece, Italy, The Netherlands, Norway, Portugal, Roumania, Spain, Sweden, Switzerland, Turkey. In Asia, British India. In Africa—Egypt and the French Colonies. In America — Argentine Confederation, Brazil, Chili, Equador, Guatamala, Mexico, Peru, United States of Colombia, Uruguay and Venezuela.

In England there is a strong sentiment in its favor among men of more advanced thought ; in fact, in 1863 a bill passed the house of commons by a large majority, making the metric system compulsory after three years, but the bill was not approved by the house of lords. However, in 1864 a bill was passed by both houses legalizing the system, but not making its use obligatory. There yet remains to be mentioned the steps taken toward the final adoption of the metric system in our own country.

For more than twenty years congress has shown a disposition to meet the people more than half way in this good work, both by legalizing the system and by providing the several states with sets of standard metric weights and measures.

The following is the text of a law approved July 28, 1866 :

"Be it enacted by the Senate and House of Representatives of the United States in Congress assembled, That from and after the passage of this act it shall be lawful throughout the United States of America to employ the weights and measures of the metric system, and no contract shall be deemed invalid or liable to objection because the weights and measures expressed or referred to therein are weights or measures of the metric system."

And the following act was approved July 27, 1866 :

"Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Treasury be, and he is hereby, authorized and directed to furnish to each state, to be delivered to the governor thereof, one set of the standard weights and measures of the metric system for the use of the states respectively."

The possibility of the convenience now experienced in the operations of the "General Postal Union," which was formed at Berne, Switzerland, in 1874, by a congress composed of representatives from all the countries of Europe (including even Russia), Egypt and the United States, is an outcome of the metric system.

As a result of the formation of this "Postal Union" the following act was passed by congress and approved June 22, 1874, namely:

"The Postmaster-General shall furnish to the postoffices exchanging mails with foreign countries, and to such other offices as he may deem expedient, postal balances denominated in grams of the metric system, fifteen grams of which shall be the equivalent for postal purposes, of one-half ounce avoirdupois, and so on in progression."

All foreign mail matter is weighed in accordance with the provisions of this act.

Every time that we pass a nickel or a fractional silver coin we are handling a practical illustration of the metric system. Our 5-cent piece is two millimeters thick, two centimeters in diameter and it weighs five grams. Our fractional silver coins represent metric weights also. Although the $1 piece retains the old weight of 412½ grains, the fractional pieces are proportional divisions of an imaginary dollar of 25 grams weight ; hence, the 50-cent piece weighs 125 decigrams ; the 25-cent piece, 675 centigrams, and the 10-cent piece, 25 decigrams. Besides these statutory provisions by congress, the metric system has been put into practical use in some of the departments of public service. Since 1878, the metric system has been in exclusive use in the United States Marine Hospital Service.

The *meter* has been used in the operations of the coast surveyor ever since the organization of the service.

As all scientific treatises written in Continental Europe have the results of investigations stated in the metric system, and because measurements used in making scientific investigations in our country are very extensively metric, for several years past all the colleges of our country have made a knowledge of the metric system a requisite for admission.

Recently many industrial and scientific associations of our country have become interested in metrological reform. The Western Association of Architects and the Boston Society of Civil Engineers deserve especial mention in this commendable work, the former of which, at a convention held in Chicago, November 19, 1886, adopted the following resolution :

"*Resolved*, That this association recommend the adoption of the metric system of weights and measures, and that the president appoint a committee whose duty it shall be to correspond with other organizations interested in this subject, and, in connection with them, petition congress to pass a law making the use of the metric system compulsory after a reasonable period."

In closing the third general division of my subject, let me recapitulate a few of the most important facts that we have learned.

In the first place we learn that we are using a complex, irrational, heterogeneous *lot* of measures, such as no other nation in the whole world employs.

In the second place, we learn that we have at hand as an admirable substitute for these inconvenient measures, a simple, scientific, homogeneous *system* of measures known by the name of the metric system.

In the third place, we learn that almost all the civilized governments of the earth, both republican and monarchial have compelled their subjects to use this system in legal transactions.

In the fourth place, we learn that the government of the United States, the high educational institutions, and the advocates of the advancement of social science have been opening the way for the exclusive use of the system in our own country.

In the fifth place, we learn that as a *people* we are sadly behind the age in metrological reform.

In the face of this array of incontestable evidence, both foreign and domestic, in favor of the metric system, the question presents itself to us, what should we, the people of the United States do, in order to secure to ourselves the blessings that would accrue from the exclusive use of the metric system in all business transactions.

It seems to me that the course that should be pursued by every *intelligent* citizen is very plain. He should devote a little time to the study of this simple and incomparably superior system of weights and measures. It would not require more than an hour to learn and to understand thoroughly the whole system, and if anyone is ignorant of the fact, I will state for his information, that, through the influence of the American Metrological Society, every grammar school or higher arithmetic published within the last ten years has in it the tables of the metric system, with all necessary explanations. They occupy so little space in the books that most teachers, being entirely ignorant of their great value, and ignoring the fact that frequently the most precious articles come in small packages, pass them by unnoticed.

The constitution of the United States makes special provision for this very emergency in Article I, Section VIII, clause 5, in these words :

"Congress shall have power to coin money, regulate the value thereof, and of foreign coin, and *to fix* the standard of weights and measures." And in the clause 18 of the same section "Congress is empowered to make all laws which shall be necessary and proper for carrying into execution the foregoing powers."

These are merely general suggestions. As I am a man who believes in definite declarations and specific proposals, I would have laws enacted making the exclusive use of the metric system obligatory in all kinds of government service after January 1, 1895, and in all transactions between citizens of the United States, after January 1, 1900.

This length of time is abundant to educate the people for the change. Let congress pass the obligatory act as soon as possible, then let the President of the United States transmit to the governors of the states copies of the enacted law, with an earnest recommendation that the governors urge upon the various legislatures of the different states the necessity of providing means for proper instruction in the metric system in every school in the country.

The education of both the rising generation and adult members of the community could be accomplished at very little additional expense to each school district by furnishing for each school building a plain set of metric apparatus, by providing for immediate instruction in the system, and by prohibiting after June, 1895, instruction in any other than the metric system of weights and measures. All this accomplished, a *new* era would be inaugurated. New joys would be added to school life ; both teacher and pupil would be greatly relieved. The mathematics of business, trades, and professions would be reduced to the minimum ; international commerce would receive a strong impetus ; every national, industrial, social, and personal interest would be highly promoted, all because a lot of complex, irrational, and heterogeneous weights and measures has been sunk into eternal oblivion by the substitution of the simple, scientific and homogeneous metric system.

European Competitions.

MR. H. MAACK, principal of the Academy of Architecture and Building in St. Louis, reports the following European competitions :

Plans are wanted for a theater to cost $100,000 ; three prizes offered : *a*, first prize, $700 ; *b*, second prize, $500 ; *c*, third prize, $250. The right is reserved to select suitable plans for the sum of $150 from those rejected.

As judges will act : 1. Baurath (Council of Building) Boeckmann from Berlin ; 2. Baumeister v. d. Hude, from Berlin ; 3. Government Inspector of Theaters Anno, from Berlin ; 4. Government Inspector of Theaters Brandt, from Berlin ; 5. Engineer Wippermann, from Essen ; 6. City Building Commissioner Wiebe, from Essen ; 7. City Mayor Zweigert, from Essen.

Competition will be closed March 31, 1889, 8 P.M. Details may be had free of cost from Herrn Oberbürgermeister Zweigert, Essen, Germany.

The division "Nederlandsch-Indië" of the Dutch Institute of Engineers to Batavia, offers besides a diploma, a prize of $200, for the best essay, to be a practical guide for the appliance of hygiene (science of health) to buildings in Dutch East India. Two hundred dollars are added to the above from the "Vereenigung tot bevordering der geneeskundige wetenschappen in Nederlandsch-Indië."

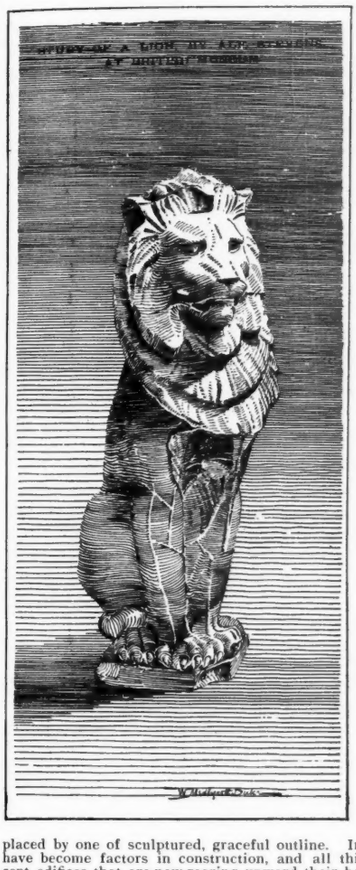
The essay is open to all nations ; it may be written in Dutch, English, German or French. Closed October 1, 1889. Details may be obtained from L. J. Resner, president, or J. Frenkel, secretary.

A prize of $5,000 is offered in Germany for the best work on "Heat going through bodies," depending on the material, form, and situation, velocity of heat in air, etc. For details address Dr. Hans Bunte, Professor an der Technishen, Hochschule in Karlsruhe, or J. Einbeck, Oberingenieur in Stuttgart, or on der engere Vorstand des Vereins deutscher Ingenieure, Berlin.

Proceedings of the Third Annual Convention of the National Association of Builders.

COMPILED FROM THE OFFICIAL STENOGRAPHICAL REPORT.

FIRST DAY—MORNING SESSION.



THE third annual convention of the National Association of Builders was called to order at 10 o'clock Tuesday morning, February 12, 1889, in Franklin Institute Hall, Philadelphia, Pa., John S. Stevens, of Philadelphia, president, in the chair.

The session was opened with prayer by Rev. John Peddie, D.D.

The president introduced the Hon. Edwin H. Fitler, mayor of the city of Philadelphia, who spoke as follows:

Mr. President,—I have a pleasant duty delegated to me, and that is, as chief magistrate, to welcome to our City of Brotherly Love the members of the National Builders' Association of the United States, and to tender to them the hospitalities of our citizens. If centuries of time add honor to a trade, then yours is an honorable one. While the product of other trades has fallen and crumbled in the dust, that of yours has resisted the rot and the rust of ages, for there is still left upon the face of mother earth the handiwork of your ancient predecessors. This annual gathering of your clans for the mutual exchange of thoughts and ideas is bearing its fruits, for you are keeping pace with the progress and march of improvements. The combustible building is giving way to the incombustible, in order to resist the destructive element, fire. The severely plain structure is being replaced by one of sculptured, graceful outline. Iron and steel and terra-cotta have become factors in construction, and all this is verified by the magnificent edifices that are now rearing upward their beautiful proportions under the skillful hands of the builders of Philadelphia. To me it seems that the great International Exhibition of 1876 was a revelation, and I date the revival in this city, in the decoration of our homes, in adding to our comforts and conveniences, and in the improvement in the style and beauty of our architecture, to that great event. Formerly we were satisfied with a plain and unpretentious building, but now the skill of the architect, of the builder, and of the workman is taxed to its utmost to produce designs and results that will satisfy the advanced ideas of the people, and the day is not far distant when all structures will be erected with a view that the building shall protect its inmates, and not that the inmates shall protect the building. I again, gentlemen, tender you a most hearty welcome, and, in closing, will say that there is plenty of room at the top of the ladder.

President John S. Stevens arose and delivered his annual address, as follows:

THE PRESIDENT'S ADDRESS.

GENTLEMEN OF THE CONVENTION,—On this, the third annual gathering of the National Association of Builders of the United States, it becomes my pleasant duty to bid you welcome to the hospitalities of the Master Builders' Exchange of Philadelphia.

Our honored mayor, in his eloquent address, has tendered you the freedom of our city and the cordial good wishes of its citizens. We all feel highly honored that so distinguished and influential a body has chosen this city for its place of meeting, and it will give us much pleasure to minister to your comfort and entertainment while you sojourn with us. Much of our time and attention must, of necessity, be given to the consideration of matters of great importance that will come before us for action, still we hope to have some little time for enjoyment.

It is not necessary for me to reiterate the objects that influenced the formation of the National Association of Builders, or the causes that led thereto. These have been fully stated by my predecessors in office in their opening addresses at the former conventions; but I may be excused if I emphasize the thought that guided and influenced the originators, to wit: The establishment of uniformity and harmony of action, upon general principles, in all matters that directly affect the interests of contractors, manual workmen and all concerned in the erection and construction of buildings throughout the United States.

The most important question with us, at this time, is what has been accomplished in this direction?

To answer this query I will briefly refer to some of the subjects that have been considered by this body and the action thereon.

First, the "Uniform Contract." The report of the committee will doubtless give you all of the particulars, but I may be pardoned for saying here that while we do not claim to have made a "perfect contract," yet this one is far in advance of any that has been used heretofore in establishing equitably the duties and responsibilities of owners, architects and contractors. It is today largely in use throughout the United States in the offices of many leading architects.

Then, again, the intelligent discussions on the "Lien Law," on the preparation of a plan for "Permanent Arbitration," "Uniformity in Measurement," "Uniform Size of Brick," "Insurance Against Accidents to the Public," "The Apprenticeship System," etc.

Has anything been accomplished? I think you will all answer affirmatively. As regards the views expressed by the National Association on the apprenticeship system at its first convention at Chicago, and again at Cincinnati last year, they seem to have taken hold of the public and been adopted by them. The press of the country has, in many leading editorials, discussed the subject and is busy molding public opinion. Already steps have been taken that look toward the early establishment of trade schools, and some of our public-spirited citizens are devoting their means in support of such enterprises. Notably among these I may be permitted to name Col. R. T. Auchmuty, who, not satisfied with the good accomplished by his New York trade schools, which were established and are supported by him, but has offered to the Builders' Exchanges of Boston and Philadelphia a very large sum of money toward the establishment of such trade schools under the auspices of the exchanges in these cities.

You have all heard of the princely gift of Philadelphia's honored philanthropist, Isaiah V. Williamson, who, with his millions, proposes to found a mechanical trade school, which, under the wise management of an efficient board of trustees, will accomplish a work that will join the name of Williamson with that of Stephen Girard as a benefactor of American youth.

We are assured that we see here the beginning of a new era, fraught with beneficial results to the nation at large that cannot be fully estimated.

We hope, through the efforts of these schools and the widespread influence of the public press, as well as by our individual effort, to encourage the American youth to see and understand the "nobility of labor." To make them feel that it is more honorable to be a good mechanic, earning good wages, than to be a poor bookkeeper or clerk, on a mere pittance.

In a pamphlet written by Mr. J. Hampton Moore, in reply to Henry George's address on free trade, he forcibly says: "The American youth is keen to seize upon the golden opportunity; American fathers are proud of their sons, and the tendency is to train them to be professional men. You don't want your boy to be a laborer; you want to make a lawyer of him. Another father turns his boy's attention to the ministry, and still another to medicine. In fact, anything is selected that will save him from the drudgery of mechanical or other laborious work. The effect of all this is bad; there is not room in the professions for all, and many become the satellites of capital, or fall by the wayside. Why is all this? Because the inducement to learn a trade or do manual work is not sufficient. The father may have managed to work at a trade himself, and sustained his family, but he wants something more remunerative for his boy. This is natural; but seeing that the professions were overcrowded, and that carpentry would pay better than medicine, young America would not hesitate to take the best paying situation. I am free to say I would rather be a bricklayer at $5 a day than a lawyer or government clerk at $2."

Gentlemen, we look for the time to come when we are to be no longer dependent on foreign labor in the erection of our buildings. The "birds of passage," as I have heard them called, who come here in the spring of the year, and return to their own country in the fall, taking with them our American money, upon which to live in comparative idleness during the winter months, leaving behind them too often the seeds of anarchy, atheism and communism in exchange therefor.

I am pleased to know that many of the leading workingmen regard the establishment of trade schools with favor. Some time since I read the opinion of many of them, as published in the *Press* of this city, and I take the liberty of quoting one of them, which has no uncertain sound:

Andrew Magill, president of the Journeymen Bricklayers' Protective Association, was of the opinion that the school will not have the least effect on the wages of the mechanics in this or any other city. "What this city needs," said he, "is a class of mechanics who are versed in all branches of the trade. We have not many such now, and we can only expect to get them from schools where all the branches of the trade are taught. No mechanic should look on this school as a menace to his interests, as it will advance rather than cause a decrease of their wages. Philadelphia and all the big cities can well afford to have any quantity of young mechanics in them such as this school will turn out. It will keep out the cheap labor of Europe, and make the work and all the surroundings more pleasant. None of the bricklayers in this city need feel worried about their position."

Let us then, gentlemen of the convention, encourage and aid in the establishment of trade schools, and it will not be long before we shall have American mechanics to build with American materials our American buildings.

Our honored secretary, in his report, will doubtless tell us of much that has been done during the year; of meetings arranged for and successfully carried out, that have resulted in the formation of new exchanges, reorganization of defective ones, and the infusion of new life into some that were already established. Early in the year a visit was made to Rochester and Syracuse. The president was accompanied by Secretary Sayward, Vice-President Tucker and Brother Eidlitz, Chairman of our Legislative Committee. Their well-timed remarks and eloquent appeals did much to make our visit to these exchanges pleasant and profitable. We spent a short time at Albany sowing seed, that we trust may yet result in good to the builders of that city and the National Association.

On another occasion visits were made to the exchanges in Buffalo, Cleveland, Cincinnati, Pittsburgh, Wilmington, Del., and Newark, N. J., with, as we trust, profitable results.

Enough has been said, and I have detained you too long. We will now enter upon the business of our third annual convention. The work before us is of great importance, and I feel assured it will receive, as it well deserves, careful consideration at your hands.

Secretary William H. Sayward announced as assistant secretaries William Harkness, Jr., of Philadelphia; Charles W. Voshall, of Rochester, New York, and M. E. Kavanaugh, of Cleveland.

On motion of A. McAllister, of Cleveland, a committee of five on credentials, to which was added the secretary, was appointed by the president. This committee included A. McAllister, of Cleveland, Ohio; William P. Jungclaus, of Indianapolis; M. Breen, of St. Paul; A. W. Kelly, of Worcester, and D. V. Purington, of Chicago.

After the reading of invitations to visit points of interest, and general amendments, on motion, the convention took a recess until 2 o'clock P.M.

FIRST DAY—AFTERNOON SESSION.

President Stevens called the convention to order at 2 P.M. In response to the call of the president for the presentation of the report of the Committee on Credentials, Assistant Secretary Voshall stated as follows:

The Committee on Credentials beg leave to report that there are one hundred and fifty-eight (158) delegates and alternates represented.

Your committee recommend that alternates and visitors be entitled to seats in the convention, but to have no voice or vote only in the absence of a delegate.

On motion, the report of the Committee on Credentials was accepted and ordered to be printed as part of the minutes.

On motion, the reading of the minutes was dispensed with, and the next business in order being the presentation of resolutions, the president stated that the resolutions as presented would be read and without debate referred to the Committee on Resolutions appointed last year: A. McAllister, of Cleveland, Ohio; William Taylor, of Kansas City, Mo., and D. J. Macarty, of Washington, D. C. The president further stated that in case of any vacancy in said committee, caused by absence or otherwise, the committee have the authority to fill the same.

The following resolutions were then presented and read:

Mr. John Grace presented the following resolution from the Cincinnati Builders' Exchange:

January 23, 1889.

Resolved, That the delegates to the National Convention be requested to bring the matter of government contracts before that body and request them to call the

attention of the authorities at Washington, and endeavor to have them let the government work, the different branches, separate.

George W. Roydhouse presented the following resolutions from the Philadelphia Master Builders' Exchange:

Resolved, That inasmuch as all builders have to secure special insurance on a building in process of erection, under what is known as "builder's risk," it would be advisable to establish a fire insurance company, under the special patronage of the National Association, for the purpose of insuring all such, as well as other risks; and in consideration of such patronage, the national body or local associations to receive a percentage of the profits arising therefrom, if practicable.

Resolved, That the matter be referred to a committee of seven, including the president of this body, Mr. John S. Stevens, to take into consideration the advisability of the organization of such a company, with full power to act, without any expense or liability to this body, or any local associations.

William Taylor presented the following resolution from the Kansas City Builders' and Traders' Exchange:

Resolved, That it is regarded by the National Association of Builders as unbusiness-like conduct and worthy of public censure for any contractor who is a member of a filial body of this association and doing business outside of the city in which he resides not to work in accordance with the established rules and principles of the local association in which the work is being executed; provided, however, that said rules and principles do not work an injury to the contractor by such work.

George F. Neiber presented the following resolution from the Cincinnati Exchange:

Resolved, That the thanks of this association be tendered to the Honorable Benjamin Butterworth for his manly defense in Congress of the United States of the rights of American citizens.

On motion, the above resolutions were referred to the Committee on Resolutions.

J. M. Blair, Cincinnati: Mr. President, I have a subject that does not perhaps come under the head of resolutions, or reports on resolutions, but if I can have the attention of yourself and the convention, I would like to read what I have here. It is a matter referring to a suit at law in the city of Cincinnati, wherein a firm of contractors entered suit against the Journeyman Bricklayers' Union No. 1 of Ohio, upon which they obtained a judgment for damages to the amount of $3,700. It is a matter of the greatest vital importance to every member of the National Association of Builders.

The president asked the convention whether it was the pleasure of the members that Mr. Blair should read the report of the case to which he referred. It was so ordered.

After the reading of the document, which was listened to with great attention, the document read by Mr. Blair was ordered printed in the proceedings.

The President: The thanks of the meeting are due to Brother Blair for the paper he has read, as it contains matter of great importance to all of us; but I think that the arbitration committee of the Philadelphia Exchange could have stated all that the honored judge has in many less words. It might not have been quite as legal, but probably would have contained as much common sense.

George C. Prussing, Chicago, Ill.: Mr. President, before reading the resolution passed, I will state to the convention that the annual meeting of the Chicago Builders' and Traders' Exchange

Resolved, That this Exchange urge upon the National Association the necessity of exerting its influence in the direction of changing the obligation of bonds required for the faithful performance of work on public buildings so as to protect all claims for work rendered, or material furnished, in the execution of such contracts.

In pursuance of that resolution, the following is hereby introduced by the Chicago delegation:

WHEREAS, Bonds are required of contractors for public works by the government of the United States, the governments of the various states, county boards, city and village authorities, conditioned upon the faithful performance of the work according to plans and specifications by the contractor; and

WHEREAS, Instances multiply in which the work is satisfactorily completed, but sub-contractors are defrauded out of their just dues for labor and materials furnished, and for which no liens will lie, inasmuch as no liens are possible on public buildings; and

WHEREAS, A remedy may be found by requiring a bond of contractors in sum sufficient to cover all possible liability and conditioned upon the faithful performance of the work, and the discharge and satisfaction of all just claims for materials and labor furnished in the execution of such contract; now, therefore, be it

Resolved, That the executive officers of the National Association of Builders be, and they are hereby, instructed to submit to the Secretary of the Treasury and the supervising architect the necessity of such rule, and to memorialize the governors of the various states and urge upon them the justice and urgency of an enactment covering the points set forth, and as per draft hereunto annexed; and

Resolved, That each local exchange and builder be, and they are hereby, requested to call the attention of the legislatures of the various states to this matter, and bespeak their coöperation in the early passage of the following:

Be it enacted:

SECTION 1. That when public buildings or other public works are about to be built, repaired or ornamented under contract at the expense of this state, or of any county, city, village, township or school district thereof, it shall be the duty of the board, officers or agents contracting on behalf of the state, county, city, village, township or school district, to require sufficient security, by bond, for the faithful performance of said work and for the payment, by the contractor, for all labor performed or materials furnished in erection, repairing or ornamenting of such building or other public work, done upon order or request of said contractor.

SEC. 2. Such bond shall be executed by such contractor to the state, county, city, village, township or school district, in a sum equal to the amount of contract and with such sureties as shall be approved by the board, officer or agent acting on behalf of the state, county, city, village, township or school district, as aforesaid, and conditioned for the payment by such contractor, as the same may become due and payable, of all indebtedness which may accrue to any person, firm or corporation, on account of any labor performed or materials furnished upon the order or request of said contractor in the erection, repairing or ornamenting of such building or work. Such bond shall be deposited with and held by such board, officer or agent, for the use of any party interested therein.

SEC. 3. Such bond may be presented, and recovery had, by any person, firm, or corporation, to whom any money may be due and payable by said contractor, on account of labor performed or materials furnished in the erection, repairing or ornamenting of such building or work in the name of the people of the state, county, city, village, township or school district, for the use and benefit of such person, firm or corporation; *provided*, such claim is filed with such board, officer or agent within thirty days after such work has been done, labor rendered or materials furnished, and action for recovery shall be commenced in any court of record within thirty days thereafter; and *provided*, that the state, county, village, township, or school district shall, in no case brought under the provisions of this act, be liable for costs.

On motion, the resolution was referred to the Committee on Resolutions.

In response to the call of the president for the reports of the committees, the following were presented: Report of Legislative Committee on Uniform Contracts, on Lien Law, on Rules and Conditions for Estimate Work, on Permanent Arbitration, on Bureau for Furnishing Sureties on Builders' Estimates and Contracts, on Apprenticeship, on Uniform size of Brick, on Insurance against Accidents to Workmen and Others.

Secretary Sayward read his annual report, after which the president appointed as the committee to report time and place of next convention, and to nominate officers L. P. Soule, of Boston, Mass.; John Rawson, of Grand Rapids, Mich.; William A. Rutter, of St. Louis, Mo.; William H. Stewart, of Cincinnati, Ohio, and Asher Bassford, of St. Paul, Minn.

The president stated to this committee that their report would be the first order of business on Thursday afternoon.

The treasurer, Mr. George Tapper, of Chicago, Ill., read his report, and the Auditing Committee reported it correct. The receipts and expenditures of the year had been about equal.

After an entertaining address by William M. Smith, president of the Common Council of Philadelphia, on motion, the convention adjourned until 10 o'clock Wednesday, February 13, 1889.

MORNING SESSION — SECOND DAY.

The convention was called to order by President Stevens at 10 o'clock A.M. Assistant Secretary Voshall called the roll.

CONSIDERATION OF REPORT OF COMMITTEE ON UNIFORM CONTRACTS.

In response to the call of the president, Mr. George C. Prussing, of Chicago, read the following report of the Committee on Uniform Contracts.

REPORT OF COMMITTEE ON UNIFORM CONTRACTS.

Your Committee on Uniform Contracts, appointed at our second convention to act jointly with committees appointed by the American Institute of Architects and the Western Association of Architects, each empowered by the respective bodies by them represented "to prepare and adopt in such committee of conference a form of contract properly protecting the interests of owner and contractor," and "vested with power to print the form of contract that may be agreed upon by said committee of conference, and distribute the same to the individual members of all associations represented, with a recommendation of its adoption," respectfully submit the following:

The impossibility of reaching practical results by correspondence became apparent to all after a few months' trial, and a joint meeting was agreed upon and called to New York on June 6, 1888, where the joint committee met in the rooms of the American Institute of Architects, No. 18 Broadway.

This association was represented by Messrs. John S. Stevens, of Philadelphia; John J. Tucker, of New York, and George C. Prussing, of Chicago; Mr. Stevens serving in the place of Mr. Edward Scribner, of St. Paul, who was prevented from attending by ill health.

Mr. William H. Sayward was also present.

The American Institute of Architects was represented by Messrs. O. P. Hatfield, of New York; Alfred Stone, of Providence, and J. H. Windrim, of Philadelphia, and the Western Association of Architects was represented by Messrs. Samuel A. Treat and W. W. Clay, both of Chicago.

The meeting organized itself by electing Mr. O. P. Hatfield president and appointing Mr. W. H. Sayward secretary, of the joint committee.

It will be noticed that the first meeting of the committee was attended by five practicing architects—one of the gentlemen appointed, Mr. James F. Alexander, of Lafayette, being absent—and only three builders.

But such is the character of the gentlemen appointed that, while wide differences of opinion were held and the articles submitted provoked long and earnest debates, made interesting and profitable by the large and varied experience of the participants in different sections of our country, there was not an instance in which upon roll-call the members divided strictly on the line of their profession or calling, all strove honestly to do even-handed justice to all parties in interest—the owner on the one hand and the builder on the other—and to set forth clearly the rights and duties of the architect acting as agent for the owner.

When finally agreed to with practical unanimity the various articles were left in charge of Messrs. Hatfield and Sayward as a sub-committee to arrange, submit to criticism and correction by high legal authority, print, re-submit to the various members of committee for review, and then, in order to secure absolute uniformity and control, finally to copyright form so perfected in the name of the joint committee, and license some responsible publishing house as its sole publisher.

Of the various propositions made, that of the Inland Publishing Company proved the cheapest to purchasers of blank, and was deemed the most advantageous otherwise, and it has been duly licensed by your committee for five years.

To what extent your committee has succeeded in framing an instrument which will meet the various and varied circumstances constantly arising, can be demonstrated only by the continued use of the form adopted and attached hereto as part of this report.

Time will demonstrate the advisability of changes and amendments. When so shown, the machinery for perfecting the form is at hand and can be readily set in motion by reassembling the joint committee.

Affiliated bodies cannot make changes.

Builders and architects have had an opportunity to familiarize themselves with its provisions by the distribution of sample copies to each of the members of the three organizations represented in committee, and many of you have doubtless been called upon to execute building contracts on this blank.

Your criticism is cordially invited, and should be addressed to the chairman of this committee in writing.

By the foregoing the necessity of the existence of a permanent joint committee is shown.

Your committee, therefore, conclude by proposing the following resolutions:

Resolved, That the Committee on Uniform Contracts be and it is hereby made a standing committee on the National Association of Builders.

Resolved, That this convention recommend to all builders the use of form of contract adopted by the joint committee of the American Institute of Architects, the Western Association of Architects, and the National Association of Builders, commonly known as the "Standard Contract."

Respectfully submitted,

EDWARD E. SCRIBNER,
GEORGE C. PRUSSING,
JOHN S. STEVENS,
JOHN J. TUCKER,
} *Committee.*

WILLIAM H. SAYWARD, *Secretary.*

H. R. Coulomb, Philadelphia: Mr. President, I move that the report be received and that the resolutions appended thereto be adopted.

Mr. Cotterall, Cincinnati, Ohio: Mr. President, before the adoption of this report by this convention I would like to state that the

Builders' Exchange of Cincinnati desire to recommend some slight modifications.

The President: You can read them, but according to the statement made by the acting chairman of the committee, and he has certainly made himself very plain in that matter, as to any suggestions or alterations that may be considered advisable by any exchange, affiliated bodies or associations, the proper plan would be to send in writing their communications to the chairman. We have no objection at all to hearing it read, because it might be a point that had great weight in it that would lead the other exchanges to make some suggestions.

Mr. Cotterall then read the changes recommended by his exchange.

The President: I hardly think it would be proper at this time to have these matters discussed. There is but one plan by which conclusions can be intelligently arrived at, and that is by a reference to the joint committee representing the three bodies who formed and compiled this contract. It is eminently proper and right that each association should criticise this, and if they have any objections to it or any amendment that they can suggest that would improve its character, it is right that they should send communications, or their written arguments, to the chairman of the committee and they will have due weight and consideration there.

The propriety of listening to the criticisms upon the form of contract was discussed by J. M. Blair, of Cincinnati; Charles A. Rupp, of Buffalo; H. R. Coulomb, of Philadelphia; John Moore, of Syracuse, and W. H. Foulk, of Wilmington, Del., after which the chair ruled that the matter should not be discussed, and Mr. Prussing, chairman of the committee, said:

George C. Prussing, Chicago: Mr. President, I submit to the good sense of this convention and its presiding officer that the committee was appointed under a certain resolution, clear and emphatic in its language, and identical with the same resolution adopted by the American Institute of Architects and the Western Association, and that the committee has fulfilled its duty to the letter, and comes here with the result of its labors, and inasmuch as you gave to that committee authority, you should respect it. I will read it to you, "vested with power to print the form of contract that may be agreed upon by said committee, and distribute the same to individual members of all associations represented with a recommendation for its adoption." You gave the committee that power and it is the identical power that the other committees had. I take it on the floor of this convention that you cannot even criticise it without infringing on the laws of good taste, to say the least. The manner of writing the document was agreed to, and then this committee was appointed to perfect it as time would show that perfection was needed. You have not given it sufficient time, I take it, to know of its defects thoroughly, and all criticism, in my judgment, is ill-timed and certainly out of place in a large convention like this, but must be considered carefully in committee. The manner of perfecting that instrument is to write your suggestions and amendments and whatever you may have to say on it; arguments—put them on paper, give them to your committee and it will weigh the evidence then before it and bring it before the joint committee, and your contract will slowly be perfected, and only in that way can it be done. I will state, furthermore, that the American Institute of Architects has had its annual convention, and the Western Association has had its convention, and both adopted the report of the committee as rendered, and recommended each of their members to adopt the contract as perfected. I take it that any debate on the subject is superfluous, because it is not within the power of this meeting of the National Association, legislative body though it may be on some questions, to consider the question. I submit it is out of place in this convention.

A. McAllister, Cleveland, Ohio: I move the report of the committee be accepted, and that the resolutions thereto attached be adopted.

The question was called for, and the resolution that the report be accepted and the resolutions thereto attached be adopted was carried and so ordered.

The report of the Committee on Lien Law was read by Assistant Secretary Kavanaugh, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON LIEN LAW.

At the last convention of this association held in Cincinnati, the Legislative Committee submitted a report upon the lien law, giving their views as to general points which should be covered in all lien laws, in order to secure a reasonable uniformity in the various states of the country. This report was at first adopted, but after certain agitation that action was reconsidered, and the whole matter was referred to the incoming committee of 1889.

That committee, having thoroughly examined the report of last year and considered the subject proper in its various phases during the twelvemonth which has elapsed, make the following report:

In their opinion the recommendations of the committee of last year are eminently just and fair, and the various interests to be considered in the protection offered by laws of this character were placed by that committee in the proper order, namely:

First. Personal laborer.

Second. Labor furnished, or labor and material furnished by sub-contractors.

Third. Labor or materials or both furnished direct to owner, either by contract or otherwise.

Fourth. Material furnished to a direct contractor.

While your committee are satisfied that no other claims should in any event have the protection of a lien law, they are very thoroughly convinced that there is little real justice in any lien law whatever, that its existence in any form is an encouragement to unreliability, and is a legal premium offered to dishonorable practices; they see no reason why anyone who sells goods to a builder should have a method of securing himself upon a third party any more than the merchant who sells goods to any other class of people.

They are aware that it will be urged that the existence of the opportunity for the seller to attach the property of the owner will stimulate the owner to employ only reliable builders.

They are also aware that it will be claimed that the non-existence of the opportunity to attach will lead the owner to make contracts with unreliable builders with the distinct purpose of defrauding the seller of material, or of permitting him to be defrauded by the dishonest or unreliable contractor, while he, the owner, reaps the benefit in the low price at which he secures a contract; and they are aware that it will be confidently stated that dishonest owner and dishonest contractor will enter into collusion with each other to divide the spoils of such fraudulent transactions.

While these arguments will be made and urged with great force and persistency, your committee are also well assured that the arguments on the other side are of greater force and weight.

We protest that this protection is in itself a species of class legislation, and that the arguments in its favor place altogether too much reliance upon a dishonesty of owners, which, to our mind, is more of a theory than a condition.

Your committee claim that this desire on the part of owners to deal with unreliable builders simply for the sake of a lower price is an assumption that will not bear critical examination from the standpoint of common sense; that it has, at all events, been magnified far beyond the facts in the case; and that the real truth of the matter is that the very large majority of the public are continually trying to avoid the unreliable and dishonest contractors because their best protection in the quality of the labor performed, "the goods delivered," is to be found by so doing, and they do not need the stimulus of a lien law to push them to this conclusion. It is only the minority, and a very small minority of the public at that, who are eaten up with such a desire to get their buildings for next to nothing that they will run all risks imaginable to gain this point. Therefore, a law to cover a condition which only a minority create and by the enforcement of which the majority are injured, is unfair and unreasonable. Therefore, a law which encourages a certain class in the community to sell goods to anybody, no matter who, under the wing of a law which says to them, "If you can't get your money of the man you sell to, you shall be permitted to get it of someone else," is improper in its intent and contrary to one of the very fundamental features of trade—a protection which no other sellers have, and which works directly against the honest man on either side.

Your committee claim that the honorable, reliable and responsible builder, whom they believe this association represents, is directly wronged by such laws as these, for the sellers of material are an immense class, outnumbering the building owners ten to one; they are an eager class, pushing to sell, and with lien laws for their special protection they are the prolific cause of foisting upon the market a shoal of unreliable contractors, while if no such laws existed they would look, the same as every other merchant must, to the character and the means of the men they deal with; they would become conservative to their own good and to the good of the building community generally, and be a factor in a better condition of credit and a better class of buildings.

Your committee therefore ask that the association adopt the following resolution:

Resolved, That this association send to the legislature or governor of each state in the Union a request that action be taken to secure the amendment of lien laws so that they will only protect actual personal labor performed upon the property liable to attachment, in amount not to exceed the value of twenty-four days' work for each individual entitled to protection, and that all filial bodies be recommended and urged to do their utmost to secure in their various state legislatures the above-desired action.

Respectfully submitted,
MARC EIDLITZ,
WILLIAM HARKNESS, JR., } *Committee.*
E. L. BARTLETT,

J. J. Weaver, of Philadelphia, moved that the report of the Legislative Committee on Lien Law be accepted and the resolutions thereto appended be adopted. (Seconded.)

Mr. Prussing: I trust the convention, now that it is a legislative body, will not pass anything unless it is right. Let us examine whether this is what we mean. I call the attention of the gentlemen, in order to make my point, to the first page of the report, in which are enumerated the persons who are entitled to a lien in our judgment. The first named is the personal laborer. I take that to mean the man who works for day's wages. Of course that is of prime importance and he ought to be protected. It says second "Labor furnished, or labor and material furnished by sub-contractors." Third "Labor or material or both furnished direct to owner, either by contract or otherwise." I take it from the applause that was given to the ending of this report that we are practically of the opinion that lien laws, as they exist today, are a delusion and a snare, and, if any liens should be granted, they should be granted to the man who performs a day's work actually at the building, and they cannot take it away by any process of law, and the man who furnishes labor and material direct to the owner, and I may add, as far as my own judgment goes, nobody else. I say the man who furnishes the labor and material to the owner direct, in one instance he may be a general contractor, and in another instance he may be the contractor for a particular part of the work; but he is the man who signs a contract with the owner, and should have a lien. And I say "nobody else," because everything else complicates matters to an extent that makes the present lien laws impracticable and of no avail, and a delusion and fancied security instead of what they are intended to be. The third clause, which means the man that contracts direct, and puts his work and material directly in there, should be the second. He is the general contractor. "He is the man who contracts with the owner direct to furnish building materials for the construction or ornamentation of the building and he should have a lien, and the man who is enumerated in the second clause, the sub-contractor, should come after the general contractor if he has any lien at all, and not before him. In other words, that the material man or sub-contractor should first look to the security and the standing of the general contractor with whom he deals, and not to the building. We, as contractors and men who are better experienced in the practical operation of these laws and rules should advise legislators, who do not know what the practical operation is as well as we, what is right and proper in the matter, and, gentlemen, take my word for it, they will take your advice if properly expressed.

A long discussion took place upon the amendment offered by Mr. Prussing, regarding the transposition of the second and third clauses. The discussion broadened over the general subject of liens. The amendment was lost sight of finally, and the original motion spoken to.

H. R. Coulomb, Philadelphia: Mr. President, no gentleman here can, understandingly, speak to the question, because there are two questions before the convention; the accepting of the report and the adoption of the resolution, neither of which are proper subjects to be discussed by any gentleman who is a delegate here. If it is the pleasure of the convention to have the discussion, I would like to discuss it; if it is not, I have no disposition to discuss it. The lien law is a very nice thing. Mr. Prussing, I have no doubt, ate his breakfast this morning. Suppose the baker who furnished the hotel with the bread this morning was to come in here and arrest Mr. Prussing for the bread that he ate for his breakfast. That is just as much

good law as any lien law. Nearly all of the gentlemen here are too young to understand what first brought about the lien law. The cause that existed then does not exist at the present time. If a man buys 100 barrels of flour and sells them to a baker, the baker has title to them as soon as he gets them. If a man sells me 100,000 bricks and delivers them to my building, I should have title to them as soon as I get them and he ought to look to me for his pay, and not to Mr. Stevens or somebody else. The government contracts with Mr. Cramp to build a ship worth $1,000,000, in comparison with which our petty contracts do not amount to anything, and yet there is not a man who furnishes a jot of work to that ship who has a claim on it. When the government pays Mr. Cramp they take title to the ship and take it with them. Why does not the man who is having a building erected take the building with him when he pays for it? Why should we protect ourselves only? We want all the protection for ourselves, but we are not willing to afford other people who are interested in business the same amount of protection that we claim for ourselves. I believe this resolution offered by the committee is a proper one, and one that should be brought to the notice of every state legislature so that this lien law will be amended as the committee recommend.

D. V. Purington, Chicago: Mr. President, the Chicago delegation has perhaps occupied more than its share of the convention on this question, but I want to call the attention of the convention to a few of the absurdities of looking for protection in a law that has been amended in almost every state, altered and changed until there is hardly a vestige of the original law left. In our city of Chicago, when this matter came up before the Exchange at our annual meeting, we had a little class meeting, an experience meeting, and while we were waiting some two or three hours for the tellers to report the result of the election, we gave time to the discussion of the lien law. All the builders were there and some of the material men, and there were but two men present who had ever prosecuted a lien successfully under the law, and one of those men collected $10,000 by carrying the case to the Supreme Court of the United States, and it cost him about $11,000 to collect it, he said then he would not have collected the money if the man had not been good without any lien law. He paid the judgment. In the State of New York, with all due deference to my friend of New York, I am told on what I consider good authority that there are twenty-six different lien laws. That is to say, there are twenty-six different ways in which people can seek protection under the lien law. For instance, New York and Brooklyn have a law entirely different from the rest of the state. Is not that so?

Richard Deeves, New York: Not now; there is a uniform law all over the state.

D. V. Purington: In our state the law has been changed and amended so you can drive a team through it anywhere. It is not good for anything. As a man belonging to that class who are supposed to rely more on the lien law than anything else, I am decidedly of the opinion, after twenty years' practice, as my friend stated it, that the material men or sub-contractors for a building should look to the men rather than to the building. I am satisfied that our lien law, with its fancied security, as it exists at the present time in the State of Illinois, is a detriment to honest builders; that it fosters and encourages and builds up weak and irresponsible men, and that we, as material men, sell to these men because of the lien law, rather than because of their ability to pay. I am further satisfied that with the abolition of the lien law entirely, we should put a large amount of capital into the business of building in Chicago, and we should build up a class of men of whom we should be proud—men whom we could all trust. If you go to a large dry-goods store and buy a bill of goods, the man who sells you those goods has no lien following them; he cannot take the goods; the title passes immediately to the purchaser; he can only obtain the pay for those goods; and why should not we, like all people engaged in the mercantile business, require the men to furnish a statement of his responsibility and reliability, and if he furnishes a statement accompanied by an affidavit, as we can compel him to, if that statement is false, we can put him in jail; we can arrest him for false pretenses. In my judgment, that would be a far better way of collecting bills than under the lien law of any state.

The President: In looking this subject over, I feel that the report of the committee is one thing, and the resolution is another, and I want to have them separated, because in this report they say that they feel that such and such a person should be protected, and they start out first, second, third and fourth. In their resolution they finally say that nobody shall be protected but the first one, which is the personal laborer; so the two things conflict, and we will first take up the report of the committee.

Secretary Sayward: It is about time for Boston to say a word. I had hard work to hold myself in on the "Uniform Contract." On this subject I want to say one word. On the motion to receive the report and to adopt the resolution, I would prefer that the resolution should be adopted with a slight amendment. The resolution reads:

Resolved, That this association send to the legislature or governor of each state of the Union a request that action be taken to secure the amendment of lien laws so that they will protect actual personal labor performed upon the property liable to an attachment.

I would like to have it amended so that it should also protect the claim of the direct contractor, which I think is the intent of the committee really, and it probably was a slip in not making it. I would therefore move you that the resolution be so amended that it shall cover the claim of the direct contractor, as well as the actual personal labor of the laborer. The motion was seconded.

Mr. Prussing: As has been already said by the gentleman from Buffalo, great minds run in the same channel. The secretary has said something I meant to make a speech on. I will offer to you a resolution which was framed last night directly in the line of what the secretary suggests.

I offer this as a substitute for the resolution contained in the report:

Resolved, That this association request the governor of each state and its legislature that action be taken to secure the amendment of lien laws so as to protect the claims for wages of workmen employed in the erection of all buildings, hired by the day or hour, and for labor or materials, or both, furnished to owner direct by contract or by his order, and to those only, and that all filial bodies are recommended and urged to do their utmost to secure in their various state legislatures the above desired action.

Marc Eidlitz, New York City: Mr. President, while I have a great deal of respect for Mr. Prussing's advice, I do not think that the article can be bettered any by being changed. All these expressions are not necessary. "Personal labor" expresses it. A man who works on a building and does not get his pay in one fortnight can surely make up his mind that he wont get paid and had better go away, and he should have no more right to call on the owner. After he knows his employer does not pay him for two weeks, he may as well make up his mind to go away. He has got to be limited. Therefore, I think the language in this resolution is perfect, with the amendment of Mr. Sayward. While I am not at all conceited about it, I think it is fully as good as anything they can substitute.

Charles A. Langley, Washington, D. C.: Mr. President, the resolution says the "governor of each state." It only designates states. Washington is in the District of Columbia, and not under a state government. Does this body have any legislation that would come under any of the territorial governments? We have a very objectionable lien law in the District of Columbia, and I would like to have inserted "district or territorial government."

William A. Rutter, St. Louis, Mo.: Mr. President, I represent a material house, and if our lien law was so amended as Mr. Prussing wishes it I do not think that it would have any ill effect on us, with this exception, that if the contract requires us to give him a bond to perform the work we shall certainly require him to give us a bond to furnish the money, and we shall sign no contract to furnish work without a contract to furnish the money.

A. S. Reed, Wilmington, Del.: I submit that the resolution is right now, and I think that the amendment of the gentleman from Chicago will complicate matters. In our town the experience has been that the complication of the lien law is where the trouble is. We have a good lien law in Delaware, but the trouble is we cannot enforce it, there is so much machinery to it, and I submit we do not want any lien law at all. I say, as far as my personal experience goes, we would be a great deal better without a lien law. There is one important thing in connection with it that has not been touched upon very much during the discussion, and that is that it has built up a set of irresponsible builders and has injured the legitimate builders, and I do not think that we have ever had anything in our town, hard times, panics and everything else that has done as much injury to the legitimate building business to the city of Wilmington as the lien law.

Richard Deeves, New York: I move this whole subject of the report of the committee lay over for one year, with the understanding that the committee take up the New York lien law and its workings, and study it over.

Secretary Sayward: I do not think it would be wise for this convention, so large a number of people coming together, some of them with views that have been somewhat matured, many of them that have not been matured at all upon lien laws, to discuss any particular lien law of any particular state. With the experience that I have had in examining lien laws, not only the lien law of the State of New York, but the lien laws of all the states and territories, I can certainly testify that a person gets pretty thoroughly wound up when he gets through with it, and even that which the gentleman speaks of, the State of New York, it seems to me is really of no more value than many others, although it may seem so to him. So I think if we got into that sort of discussion it would be impossible for us to get through. It appears to me the only thing this association is competent to do, or ought to attempt to do, is to give our views upon the general principles as to what we think ought to be done in the way of general protection in this particular matter. I made a motion to amend the resolution, and I understand that the motion that is submitted by the gentleman from Chicago is as a substitute for what I suggested. I have now put mine in words and I will submit it to you. I am better satisfied with it than what has been presented, although it is exactly of similar tenor. I will read you the resolution as I have amended it.

Resolved, That this association request the governors, legislatures or authorities of each state, district and territory in the United States, to take action to secure amendments to lien laws so that they shall cover the two following classes of claims *and none other*, namely:

1. Claims for wages of workmen actually employed upon the property liable to attachment by the owner.
2. Claims for labor and material furnished direct to owner, either by contractor or upon his order.

Resolved, That all filial bodies be recommended and urged to do their utmost to secure the above desired action.

Mr. Prussing: I desire to say that what the secretary has just now read is exactly what I meant to say in his own language, and I therefore withdraw my motion as made and second the adoption of his.

Anthony Ittner, St. Louis, Mo.: I desire to say a few words on this subject, because it is a subject to which I have given a great deal of attention, not only as a mechanic and manufacturer, but as a legislator. It is a subject that wherever you go you will find two or more opinions concerning it. With all of the experience that I have had, and with all of the knowledge that I have been able to gain upon this subject, I am in favor of the proposition as pending and as amended by Mr. Sayward. Of course, even in that light it is class

legislation. If the lien law was abolished outright as far as every other individual is concerned than the laboring man and the mechanic, it might be well, and it might, perhaps, be well to abolish it as to those parties, the laborer and mechanic; but there seems to be a general disposition, and I presume it is a praiseworthy one, to protect those individuals, and I should utter no word in opposition to that spirit. I have not the pleasure of the gentleman's acquaintance on the other side of the chamber who suggested why not insert the sub-contractor. If you are going to insert the sub-contractor why not put it aside entirely, because that leaves it just as it is now. I do not presume there is a lien law in any state or territory of this Union that does not protect the original or direct contractor, the sub-contractor and the laboring man and the mechanic, hence, if you insert into this amendment a sub-contractor you have got it just about as you have it now. But the reason I am opposed to inserting the sub-contractor is this, and it has been mentioned by some of the gentlemen who have spoken here upon this subject—probably not touched upon as prominently as it should be—I say it brings in irresponsible parties, parties who have got no money, no character, no honor and no honesty or anything else except a human form. I am a sub-contractor myself, and I want you to understand that I do not desire to cast any reflection upon any man who is engaged in that calling or in that capacity in connection with the building trade interest. But I wish to reflect upon every man in the United States, from the topmost rung of the ladder down to very bottommost, if he is not an honest, honorable, fair-dealing man, and does not wish to give compensation for value received under all circumstances and in all trades and in all directions. That is what I desire to accomplish by my action here.

C. C. Dewstoe, Cleveland, Ohio: Mr. President, I wish to indorse Mr. Sayward's position, for a reason that seems to have escaped a great many of the gentlemen here. They ask why the builder should have any protection different from the merchant. The merchant has a protection in the nature of things that the builder cannot always get. The merchant sells millions of dollars' worth of goods to people who they know are utterly irresponsible, but they leave their money when they take their goods. If I do work I cannot take my money. I do not know how much I have got to take until I do my work. It is utterly impossible for builders to do business on a system of deposits in advance, and for that reason we should have recourse on the owner of the property for goods furnished to him.

C. W. Gindele, Chicago: Mr. President, seeing that the convention is consuming considerable time in this matter of the lien law, it occurred to me that I might occupy its time for a little while. I hope that the resolution, as amended by our secretary, will be passed by this convention. I think, as far as the contracting business is concerned, and contractors, that heretofore they have always been looked upon, as far as the majority is concerned, as the off-scum, as far as business matters are concerned, or as far as business principle is concerned; for this reason, there has always been something of a string tied to them in case they want to be dishonest. Everybody has looked to the fact that if Mr. Contractor buys materials and does not want to pay for them we have got something to catch him. By passing this resolution of the secretary it will give us a better standing with the community; a man can then hold up his head and walk the streets; look at the man he is buying his material from and not think that the man is looking upon him and with the expectation that if he owes him for one hundred thousand bricks, or something like that, if he does not pay him in a few days he will put a lien on him. As far as the sub-contractors are concerned, I think if they will look at this matter squarely they will find it to their interests to deal with general contractors who have the right of the lien law only, and for this purpose; because, in the first place, it will caution the architect and the owner to whom they let their work, and the material man who sells material to the general contractor will take care to see that the man he sells to is a man that is responsible and a man that occupies an honorable position in his profession, so that in adopting that resolution it will give us all a better standing, as far as the architects and the owners of the United States are concerned. I therefore move you the adoption of the resolution as Mr. Sayward has formulated it.

The resolution, as amended by Mr. Sayward, was then adopted by the convention, and the report of the committee accepted.

The report of the Legislative Committee on Rules and Conditions for Estimating Work was read, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON RULES AND CONDITIONS FOR ESTIMATING WORK.

During the year your committee have carefully considered the code which was adopted at the second annual convention for the purpose of more clearly setting forth the proper conditions under which estimates should be submitted by contractors in the building trades, and in the establishment of which it was hoped that affiliated associations would be able to secure the coöperation of architects in their several localities.

During their investigations, your committee have interviewed many parties interested, including owners, as well as architects and builders; have received reports as to action taken from filial bodies of the National Association, and beg leave to report as follows:

They find that the rules and conditions have in no case been adopted in the exact form in which they were formulated by the convention, and have not been indorsed in the manner desired, namely, *by builders and architects jointly*, in more than two or three instances.

They believe that the cause for this non-adoption is to be found in two inherent defects:

First. Clauses which solely concern builders are improperly introduced in a code which purposes treating matters of joint interest to architects and builders, and in the establishment of which architects are to be invited to coöperate.

Second. The form of words used in the title itself, as well as in many of the clauses, has seemed to those invited to coöperate to savor too strongly of arbitrary enactments, which in that guise might fail to become effective, and ought not as such to be enforced, while certain clauses were susceptible of a better and more comprehensive construction, which would render others unnecessary, and make the whole code more concise.

Your committee, therefore, recommend that the whole code be carefully amended, rearranged, and divided into two distinct portions, one portion to comprehend the conditions and methods in the establishment of which architects may properly be invited and expected to coöperate, and the other portion to comprehend those which apply to the relation of builders toward each other in matters connected with estimating.

For the purpose of securing action with as little delay as possible, the committee submit the following rearrangement and division of the code (in accordance with their recommendations) for the consideration of the convention:

1.

The National Association of Builders, in convention assembled, recommends all filial bodies to secure the coöperation of architects in their various localities (through organized bodies when possible), in the establishment of the following code, in order that there may be a well-defined and recognized system or "practice" under which estimating should proceed, bearing the approval of both architects and builders.

CODE.

Just and proper methods which should prevail when estimates are solicited from contractors in the building trades:

1. *Plans.*—Drawings, when offered for final or competitive estimates, should be sufficient in number and character to represent the proposed works clearly; should be at a scale of not less than one-eighth of an inch to the foot, and be rendered in ink or some permanent process.

2. *Details.*—Proper details should be furnished for work that is not otherwise sufficiently described for estimate.

3. *Specifications.*—Specifications should be in ink.

They should be definite where not sufficiently defined and explained by drawings, and every distinctive class of work to be included in contract should be mentioned and placed under its appropriate heading.

4. *Restriction as to Sub-Contractors.*—Contractors should be notified, at time of estimate, if they are to be restricted in the employment of their sub-contractors.

5. *Sub-Estimates in Architect's Office.*—Sub-estimates for portions of the work which principal bidders are required to *include in their original estimates* should not be received in architects' offices, either as an accommodation to principal bidders, or for any other purpose.

6. *Percentage on Sub-Contracts.*—Contractors should be allowed a compensation of ten per cent on all sub-contracts which at the time of estimate are "reserved" or not called for in their portion of the specification, but which may be assumed by them by direction of the owner or architect.

Contractors should not be denied contracts upon portion of work covered in their original estimate, on account of *declining to assume at any price* the aforesaid reserved sub-estimates in their contract.

7. *Sub-contracts.*—A sub-contractor should not (without his free consent) be "placed" under a general contractor.

8. *Binding limit of estimates.*—Estimates should not be binding more than thirty days after received.

9. *Award.*—When work is to be let, for which estimates have been solicited, unless previous notification to the contrary has been given, the lowest invited bidder should be entitled to the contract, and all minor changes should be agreed upon with him, provided his prices be equitable.

If radical changes are made, then the whole competition should be reopened.

Bidders should not be allowed to amend their estimates after the bids have been opened and before the award.

10. *Compensation for estimating.*—Should all solicited bids be refused, the lowest bidder should be entitled to compensation, as follows: For estimate of

$5,000 and under	$25.00
$5,000 to $50,000	50.00
Over $50,000	100.00

2.

The National Association of Builders, in convention assembled, recommends all filial bodies to adopt the following code, for the guidance and protection of their members in their relations to each other in estimating, in order that there may be some recognized and definite "practice" in these matters which may be referred to with certainty as "just and honorable methods":

CODE.

Just and proper methods which should be observed by all contractors in their relations to each other in estimating:

1. *Rights of sub-bidders at the hands of general contractor.*—A principal contractor having been awarded a contract involving sub-contracts, his estimate having been based upon sub-estimates, which he has solicited, should award the said sub-contracts to the lowest bidder, and should notify the sub-bidders that their estimates have been accepted or rejected as soon as the contract has been awarded to him.

The fact that such sub-bids were received by the principal contractor, previous to the submission of his estimate, should be conclusive evidence that they were used by him.

2. *Unsolicited bids.*—Should a principal contractor receive a sub-estimate unsolicited, he should not be considered under obligation to use the said bid, even if it be the lowest; but he must not reveal the bid, nor use it in any way to influence any other party.

3. *Sub-estimates in architect's office.*—Sub-contractors should avoid leaving their estimates in architects' offices when they are received there simply as an accommodation to, and for the information of, principal contractors. By such action there is danger that bids may become known to competing sub-contractors before estimates are closed.

4. *Penalty.*—Any member detected in trading on any of the sub-bids, whether they be solicited or unsolicited, or however knowledge of them may have come into his possession, should be liable to forfeiture of membership, censure or suspension.

In submitting this report your committee suggest that the National Association strenuously urge all its filial bodies to use every proper means to secure the recognition of these two codes as nearly as possible in the form here recommended, and at an early date, it being very evident that the existence of some definite system, covering the various points treated, will be of the greatest advantage to all concerned.

In the case of code No. 2 the action will be simple, for it is only necessary to adopt it within organizations of builders, but with code No. 1 the societies or chapters of architects (and in the absence of these, a combination of individual architects) must be asked to unite in joint consideration and action.

No time should be lost in establishing both codes.

Respectfully submitted,

MARC EIDLITZ,
WILLIAM HARKNESS, JR., } *Committee.*
E. L. BARTLETT,

J. J. Weaver, Philadelphia, Pa.: I move that the report be taken up seriatim, and considered clause by clause.

The motion was seconded and adopted.

Richard Deeves, New York: I move, for the facilitating of business, that no delegate be allowed to speak more than five minutes or more than once on any subject.

The motion was seconded and adopted.

The secretary then read the first, second and third clauses of the report of the committee, and there being no objection to the same, they were adopted.

The fourth clause was read by the secretary.

W. H. Stewart, of Cincinnati, moved that the fourth clause be stricken out, which motion was seconded.

Mr. Ittner: Mr. President, I hope that that action will not be taken by this convention, because, as far as my experience extends, I think that is a very wise provision, and should be allowed to remain.

I think the committee deserve credit for having incorporated it in their report.

Mr. Stewart having withdrawn his motion, and there being no objection, the fourth clause was adopted.

The secretary read the fifth, sixth and seventh clauses of the report of the committee, and there being no objection to the same, they were adopted.

The eighth clause was read by the secretary.

Mr. Prussing: Mr. President, I do not believe that we should say anything about that. I am in the habit of making my estimates for five days or ten days, as the case may be. I do not want a general rule. That ought to be left to the business of the man himself. I move that that clause be stricken out.

Mr. Ittner: I move that that clause be allowed to remain in the report, by striking out "thirty" and inserting "ten."

The motion was seconded.

Secretary Sayward: Mr. President, I am surprised that the gentleman from Chicago should object to that, because he must bear in mind that we are simply preparing a general code which shall be recognized by architects and builders together as something to guide them generally. If the gentleman chooses, whenever he makes an estimate he can put in it that it shall be only binding for five days, or ten days, or one day. That is a matter of his own liberty. But it should be recognized that at some time or another the obligation should cease. There should be some general practice or general rule to which we could refer at any time when we needed a reference, and I certainly think that thirty days is not too long. In reply to the gentleman from St. Louis, I would say that possibly ten days is a little short.

Mr. Ittner: I insist upon my amendment. I have no objection to modifying it to fifteen days, but I would not like to go beyond that time.

Mr. Prussing: I am also surprised.

A member: I move that it is the sense of this convention that Mr. Prussing is surprised.

Secretary Sayward: That reminds me of a story. Mr. Prussing wants some of my unexpired time. There was a gentleman in Chicago who was about to be hung, and the sheriff asked him if he had anything to say, and he said he hadn't, but a gentleman in the audience stepped forward and said, "I would like to use fifteen minutes of the gentleman's unexpired time," and the sheriff turned around to the man and said, "Shall he have it?" and the man said, "No; I would rather be hung." I think that the gentlemen, upon a little more consideration, will see that we are arguing for a practice which shall be sustained generally by architects and builders, and that we had better leave it thirty days. There are estimates being submitted, for instance, on three or five or six days apart, and the full contract, perhaps, is not going to be decided right away. If I am an architect I may get a bid for a portion of the work today, I may get the next bid, perhaps, a week or ten days afterward, and, therefore, it would give a proper leeway for the architect to put it at thirty days. A man would hardly be injured very much by having the matter fixed at thirty days.

(Cries of "question.")

Mr. Ittner: I have new light upon the subject now, and in view of that light, I wish to withdraw my motion.

The motion was then carried, and clause No. 8 was adopted.

The secretary read the ninth and tenth clauses of the report of the committee, and there being no objection to the same, they were adopted.

The clauses under No. 2 code were considered and the secretary read several clauses, and there being no objection to the same, they were adopted.

George R. Phillips, Providence, R. I., moved that the report of the Legislative Committee on Rules and Conditions for Estimating Work be accepted and adopted as a whole, which motion was seconded and carried.

The report of the Legislative Committee on Permanent Arbitration was read by the secretary, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON PERMANENT ARBITRATION.

The Legislative Committee have thoroughly reviewed the method of arbitration adopted at the last convention, and find no reason to suggest material change.

The only change they recommend this convention to make occurs in the third clause. They suggest that the last eight words of that clause be dropped, as they somewhat impair the meaning of the sentence.

The committee find that very little has been done so far in the setting up of this method, and in the cases where it has been attempted there has been a lack of willingness to enter into it on the part of associations of workmen on account of the clause discountenancing boycotting.

The committee recommend that all filial bodies be urged to make the attempt to establish this method, for then in case of trouble it cannot be charged that they have not tried to provide a means of avoiding strikes and lockouts.

Respectfully submitted,

MARC EIDLITZ,
WILLIAM HARKNESS, JR., } *Committee.*
E. L. BARTLETT,

On call, the secretary read from the third clause of report of Committee on Permanent Arbitration of 1888 (pp. 85-86, proceedings of second annual convention. INLAND ARCHITECT, Vol. XI, No. 2, page 26).

Mr. Phillips moved that the report be received and adopted and placed on file.

The motion was seconded and carried.

Mr. Phillips moved that clause three be amended to read as it is, leaving out the last eight words.

The motion was seconded and adopted.

W. H. Foulk, of Wilmington, Del., stated that Mr. Milo W. Lock, of Wilmington, Del., a personal friend of his, who was greatly interested in the subject of the apprenticeship system was present and would like to hear the subject discussed. Mr. Foulk further stated that at the National Board of Trade Convention held in Chicago, they appointed a committee to act in conjunction with a similar committee appointed by this convention to memorialize and to make provision for a trade school; that Mr. Lock was the chairman of that committee. Mr. Foulk moved that Mr. Lock be heard on this subject.

Mr. Lock was called upon and addressed the convention as follows:

GENTLEMEN,—I have got but very few words to say in connection with the apprenticeship system. At the meeting of the National Board of Trade, at which I had the honor to represent the Wilmington Board of Trade, I introduced a resolution, which I will now take the liberty of reading, so that you may understand it.

"WHEREAS, Since the universal abandonment of the apprenticeship system for American youth in the manual arts and general mechanical industries there has been an ever-increasing necessity for the importation of foreign skilled labor by reason of the dearth of such labor in the home market, thereby closing to Americans legitimate paths of industry and means of livelihood, and checking the development of national skill and ingenuity, while forcing vast numbers against their natural aptitudes into the overcrowded avenues of professional and industrial pursuits; and

"WHEREAS, It is believed that the establishment of national mechanical trades schools, on the apprenticeship principle, would directly remedy the existing evils hereinbefore described; therefore, be it

"*Resolved*, That the National Board of Trade hereby requests the National Builders' Exchange to appoint a committee of three to confer with a similar committee to be appointed from said Board of Trade, for the purpose of maturing plans for the concerted action of the two bodies in bringing before the congress of the United States of America the subject of the establishment of national mechanical trade schools for apprentices and the exertion of all legitimate influences for such legislation and appropriations as shall lead to the founding of said schools as permanent government institutions."

This as coming from the Board of Trade is carrying coals to Newcastle. You, gentlemen, understand this matter far better than the National Board of Trade, but they are willing to do what they can to assist this National Builders' Association to frame some act to be submitted to congress. This committee of the Board of Trade will report at the next annual meeting of their Board in Louisville, in October next, and all they ask is that this committee be appointed to meet the committee of which I have the honor of being the chairman. The members of the committee are J. S. B. Stranham, of New York City, and Andrew Wheeler, of Philadelphia, and myself, the chairman. If you appoint a committee and the chairman of the National Board of Trade committee is apprised of such fact, meetings will be held with a view to frame an act that will cover this ground, and if it is so ordered by the National Builders, we should be glad to use our utmost effort to frame such an act. I thank you for your kind attention.

Assistant Secretary Harkness, : Mr. President, I ask permission to read a resolution that has been handed to me by the New York delegation. It is as follows:

WHEREAS, It should be the unalienable right of American youth, without any hindrance, to have the privilege, if he so will, to learn a trade whereby he can in the future make an honest living for himself, and to enable him to become a useful member of society; be it

Resolved, That this convention use its influence and recommend to the legislatures of the different states of this Union the passage of a law making it a felony for any person or association to prevent or hinder an American youth from learning any trade or handicraft.

The resolution was referred to the Committee on Resolutions, and on motion the session adjourned until two o'clock P.M.

SECOND DAY—AFTERNOON SESSION.

The convention was called to order by the president at two P.M.

The unfinished business of the morning session, by the vote of the convention, was transferred until the evening session, in order that the programme for this afternoon session might be carried out as published.

James John, of Chicago, then read a paper upon "Plastering and Stucco Work." (Printed on page 17.)

A Member: I move that the convention return its thanks to Mr. John for the entertainment which he has furnished us and that his paper be published in the proceedings of this convention.

The motion was seconded and adopted.

Samuel J. Cresswell, of Philadelphia, read a paper on "Ironwork, Past and Present." (Retained by Mr. Cresswell for correction and not obtained by the stenographer.)

An address on "Masonry" was then read by John J. Tucker, of New York. (Printed on page 21.)

L. P. Soule, Boston: I move that a vote of thanks be extended to Mr. Tucker for his very able and interesting paper, and that it be printed as a part of the proceedings of this convention.

George Tapper, Chicago: Mr. President, I am one of the same handicraft with Mr. Tucker, and I want to extend to him my personal thanks for the paper and the reading of it today.

The motion was seconded and adopted.

The President: Gentlemen, Mr. John Trainor, the president of the National Association of Plumbers, with his executive committee, which is now in session, have called upon this convention, and it is with pleasure that I invite them to take seats on the platform with us.

Mr. Harkness read a letter from the Board of Education, as follows:

John S. Stevens, Esq. PHILADELPHIA, February 13, 1889.

MY DEAR SIR,—Herewith find copies of the reports of Manual Training and Industrial Art School for distribution. These schools are open for examination and you are cordially invited with the members to visit them and see the work done in them. Very respectfully, H. W. HALLOWELL, *Secretary.*

The President: The members of our convention are probably aware that in our public school system we have incorporated the manual training schools, and it is more particularly to this that the allusion is made, thinking it would be of interest to our convention.

An address on "Builders' Exchanges, Their Opportunities and Advantages," was then read by William H. Sayward, of Boston. (Printed on page 18.)

Charles W. Voshall, Rochester, N. Y.: Mr. President, I move you that the thanks of the convention be tendered to Mr. Sayward for his

able address, and that it be printed as a part of the proceedings of this convention, and I also ask for the adoption of the following resolution:

Resolved, That the address of Secretary Sayward be printed as a special paper for distribution to exchanges and in localities where exchanges do not exist.

The motion was seconded and adopted.

The President: Gentlemen, I might be permitted to say here that it was contemplated by the executive officers of the association to take what was termed a missionary tour through portions of our country where exchanges were in a weak condition, or where none exist, for the purpose of having such exchanges established; but for reasons that I suppose were very apparent to you when you heard the report of our treasurer, it was deemed inadvisable. As the next best thing to personal contact and the magnetism of his enthusiasm on this subject, we thought it would be wise for him to prepare this paper which you have listened to, and to send it out broadcast and let it prepare the way for him when he follows, as I trust he may be able to do the coming season. We want not only the new localities to be imbued with the ideas that are presented in this paper, but we want some of these older localities that are represented here to have new life, new vigor infused into them, and where their buildings have been put up on insecure foundations we want them torn down and the foundations laid broader and deeper and new structures erected. I think that such a paper as this to precede his presence will help accomplish that work, and you, gentlemen, can help do it also by your individual efforts. I thank you personally, Mr. Sayward, for the time and trouble that you have given to the preparing of this interesting paper.

There being considerable time before the hour of adjournment, the president suggested that the business set down to be considered during Wednesday morning session, which was not then finished, be now considered.

This suggestion was received with favor and the business proceeded with.

Report of Legislative Committee on Bureau for Furnishing Sureties on Builders' Estimates and Contracts was then read by the secretary, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON BUREAU FOR FURNISHING SURETIES ON BUILDERS' ESTIMATES AND CONTRACTS.

During the past year the Legislative Committee have received a suggestion from a member of the national body, of great importance — one which demands most careful investigation. The situation is, briefly stated, as follows: On certain work contractors are required when submitting estimates, or closing contracts, to furnish bonds, and, in order to comply, are obliged to ask friends to become responsible for them. This necessity is always a most embarrassing one, and while, on the one hand, the contractor feels very delicate about asking the accommodation, on the other hand, his friends consent with great reluctance.

The suggestion referred to is that a bureau or department of the National Association be established, which may furnish such bonds under proper conditions and for a satisfactory consideration.

Your committee desire to report that after serious consideration of this suggestion they are so much impressed with the desire to see some such department established, through which contractors may secure bonds upon payment of proper compensation and under proper regulations instead of being dependent upon friends for accommodation — they are so thoroughly convinced that the peculiar position of the National Association affords the most complete and perfect machinery for carrying out the idea suggested to them—that they recommend that steps be immediately taken to establish such a bureau, and that the present convention take action to secure its adoption during the year.

They recommend that a committee be appointed to make a thorough investigation of the subject and prepare a plan in full detail for operation. This committee to report to the Executive Committee at as early a date as possible, they in turn to give the matter thorough study and report in print to every filial body, asking for approval of course suggested. Upon approval of two-thirds of all filial bodies, the Executive Committee be empowered to establish the bureau, or to report at the next annual convention.

Respectfully submitted,
MARC EIDLITZ,
WILLIAM HARKNESS, JR., } *Committee.*
E. L. BARTLETT,

Mr. Phillips moved that the report of the committee just read be received and placed on file.

A. McAllister, Cleveland, Ohio: Mr. President, I desire to offer a resolution for the appointment of a committee to meet this matter, and provide for the furnishing of bonds such as is referred to in that report.

Resolved, That a committee of five be appointed by the chair, authorized in behalf of this association to encourage the establishment of a company for the purpose of giving sureties on builders' estimates and contracts, with the understanding that the said company shall receive the official sanction and coöperation of the National Association of Builders, in consideration of which the said company shall agree to pay a proper percentage of its profits to the treasury of the said National Association.

The motion was seconded.

J. J. Weaver, Philadelphia, Pa.: I suggest it would be better to read the recommendation again submitted by the committee, in order that we may have both plans in our minds.

The recommendation of the Legislative Committee was read.

After general discussion, Mr. McAllister accepted an amendment, to include President Stevens and Secretary Sayward, making the committee seven, and the resolution, as amended, was seconded and adopted.

The president stated that the committee would consist of the following named gentlemen: A. McAllister, Cleveland, Ohio; George C. Prussing, Chicago, Ill.; J. M. Blair, Cincinnati, Ohio; Edward E. Scribner, St. Paul, Minn.; John J. Tucker, New York; John S. Stevens, Philadelphia, Pa., and William H. Sayward, Boston, Mass.

The report of the Legislative Committee on Uniform Size of Brick was read by the secretary, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON UNIFORM SIZE OF BRICK.

The Legislative Committee have, in accordance with the vote of the last convention, conferred with the Executive Committee of the National Association of Brick Manufacturers, and report that in their opinion this association should take action to support the National Association of Brick Manufacturers in their attempt to secure a uniform size for brick throughout the country, so that to speak of a brick in Maine shall convey the same meaning, in point of size, as when the term is used in California, or in any other state or locality in the Union.

If such a result can be secured it will certainly be of great advantage, not only to builders in preparing their estimates, but also to architects in making their plans and details.

We recommend that this association adopt the following resolution:

Resolved, That, whereas, the National Association of Brick Manufacturers has adopted a report recommending a standard size for common and pressed brick, this association hereby approves and indorses the same, and recommends all filial bodies to urge conformity to these sizes in their various localities. The sizes recommended are:

For common building brick, 8¼ inches by 4 inches by 2¼ inches.
For pressed brick, 8⅓inches by 4 inches by 2⅔ inches.

Respectfully submitted,
MARC EIDLITZ,
WILLIAM HARKNESS, JR., } *Committee.*
E. L. BARTLETT,

Mr. Phillips moved that the report be received, and that the resolution thereto attached be adopted.

The motion was seconded.

George C. Prussing, Chicago: Mr. President, I would not like to see this perpetuated in a more permanent form. This question of uniform size of bricks, I submit, is nonsense. You cannot make any uniformity by law now any more than you could in the years gone by, and the brick manufacturers, in their wisdom, in their resolution, talk about a standard size, and not a uniform size, and I therefore suggest that the word "uniform" be changed at once to "standard," for that is what the brick manufacturers request, and this is merely an indorsement of action taken by them. I submit that there seems to have been some misapprehension as to the sizes.

Mr. Ittner: There seems to be some confusion about this business. I am a member of the National Brick Manufacturers' Association, and I was present at the meeting where this size was established, and this is not the size, if I am correct, and I merely wish to state my understanding of that size.

Mr. Weckler: I have a memorandum in my pocket of the size adopted at the Chicago convention as the standard size of brick. Pressed brick, two and three-eighths by four and eight and a quarter. The only difference is in the length of the pressed brick.

Mr. Ittner: Mr. President, I think, perhaps, there is even some mistake in the note of our worthy friend to the left. The point made by Mr. Prussing is a very tenable one. It is very pertinent that you should correct it from eight and three-eighths to eight and a quarter, as has just been stated, but then you leave the width as it is, and you will see it will not work; you will have a head joint that is altogether out of proportion to the bed joint. If I understand it aright, the width of that brick was four inches and a quarter, and the length eight inches and a quarter and two and a quarter for a common brick. I think, perhaps, the best way would be to have this matter pass over and allow the Brick Manufacturers' Association to arrive at an intelligent conclusion on that question before it comes to this national body. There is a confusion existing all around. The corresponding secretary of the National Brick Manufacturers' Association, after I got home, wrote me a letter, saying there was some confusion about it and wanting to know if I knew what it was. I will swear I do not know what it was. I know this much, that the National Association of Brick Manufacturers did not give it that thought and consideration that they ought to have done. I move, with due respect to the National Brick Manufacturers' Association, that this question be laid over to be considered at our next annual convention. In the meantime, the National Brick Manufacturers' Association will have an opportunity to take more definite action on the subject.

Mr. Blair: I was present at the time the National Brick Manufacturers' Association adopted something. I agree with Mr. Ittner, and I want to make it more forcible, if possible, by adding to what he has said. It was my intention from the start to oppose the resolution because it was not definite. It is right and proper that the National Association of Brick Manufacturers should fix the matter definitely, and I think it had better be postponed until a subsequent meeting. I move it be referred back to the Legislative Committee.

A vote was then taken on the resolution to refer the matter back to the committee, which was carried.

On motion, at five o'clock, the convention adjourned to meet at eight o'clock P.M.

SECOND DAY—EVENING SESSION.

The convention was called to order at eight o'clock P.M. by the president, and the roll was called by Assistant Secretary Voshall.

The consideration of unfinished business on the programme for the morning session was proceeded with.

The report of the Committee on Apprenticeship System was read by Assistant Secretary Voshall, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON APPRENTICESHIP.

The Legislative Committee have thoroughly reviewed the method approved at the last convention, to take the place of the old system of apprenticeship, and recommend a slight change of wording in the second clause, and an important change in the third clause.

They herewith present the whole method as they recommend its modification, the changes proposed being printed in italics.

Method Approved by the National Association of Builders

to establish the right of any person to be known as a regular journeyman in the building trades.

First. The serving of a regular course of instruction in a mechanical trade school and graduating therefrom with a certificate of proficiency granted by the same, under rules and regulations approved by a committee of master mechanics, who may unite in the management of the said school.

Second. The preliminary training in the trade school to be followed by a term of practice with an employer on actual work, this term to be at least one year less than the usual term of apprenticeship by virtue of the holding of a certificate of proficiency granted by a mechanical trade school. During this term of service the young man to be known as a "junior."

Third. Finally, completion of the education of the mechanic to be acknowledged *after a proper examination has been passed before a board of examiners*

appointed for the purpose by the association of builders to which the employer may belong, or to whom the junior may apply for examination by the issuance of a certificate *by* the *said* association, which shall state that the holder has passed through the prescribed course at the trade school, and the term of practice with an employer (name and location given) with satisfaction and credit, and is entitled to be received by all builders as a journeyman.

Any young man who has received the "certificate of proficiency" from the trade school, may apply for the second examination before the board of examiners, and if adjudged by them to be old enough, strong enough and competent, may receive a special certificate, which shall state the facts in the case.

The committee also recommend that this method of the National Association be persistently agitated, and that a special committee be appointed to have the matter in charge.

Marc Eidlitz,
William Harkness, Jr., } *Committee.*
E. L. Bartlett,

A. S. Reed, Wilmington, Del.: Mr. President, I would like to ask for information; I would like to know what the method would be in teaching particular branches of the mechanical trades in a trade school. I am a bricklayer, and I am anxious to know what mode will be pursued in teaching a bricklayer the first rudiments in a trade school.

The President: I have my ideas on that subject, and I will express them to you. You want to know how we would teach a boy to be a bricklayer in our school. First, I would have a lecturer to teach him by lecture all that could be taught him in regard to his business, or the materials connected with it, and I would have the lecturer tell the boy what sand is made of and all about sand; I would have him tell the class what lime is made of and how it is made; I would have him tell the class what bricks are made of and how they are made; I would have him tell them all about cement, and explain to them the nature and combination. By the time the boy was through with those lectures he would know why you could not make mortar—I am an iron man and I do not know much about bricklaying, but I will tell you all I do know about it—the boy would then know why you could not make good mortar out of ashes and lime, or out of loam and lime. He would know why you had to use gravel and why you had to use sand. After the boys had been taught to that extent, I would have them taken to a limekiln and let them have an object lesson, let them see how it was done. I would have them taken another day to a brickyard and let them see how bricks are made. I would have them taken to one of our terra-cotta establishments and let them see how terra-cotta is made. I would suppose, then, so far as that was concerned, the boys' education was completed theoretically. Now comes the question, what shall we do with them? I would have, then, a first-class journeyman mechanic, a journeyman bricklayer, such a man as you would make one of your foremen to take charge of your buildings, and I would have him take these boys, a class of, say six, or eight, or ten, and say to them, "Boys, you have been told by your professor how mortar is made, now I am going to show you." Then he would call up his laborer and say, "Here, Billy, bring so many bushels of lime and so many bushels of sand," and he would bring them and put them down on the ground. Then the teacher would tell them, "Now, when you put water on this lime, it slacks it. Now, we are going to put water on this lime and we will see it slack." Then he would mix that up and it would make mortar, and he would be talking to them and all the time they would be seeing. That finished, he would say to the boys, "The first thing you have to learn is how to use a trowel. Here are the trowels. Now, William, you put a shovelful of mortar on each of those boards, and each one of you boys take a trowel and I will show you how to spread this cement and mix the mortar," and keep the boys practicing at that, and say, "George, that ain't the way; do it this way." They would soon learn how. The next day he would come there and say, "Boys, I am going to build a wall for you six feet high, or seven feet high, and thirteen inches thick, and I want you to see how I do it." He would dig out, and commence to lay it out, and talk to the boys as he went on. "Boys, we spread our mortar this way; we take up our bricks this way; this is the way we put a leader; we run up three courses here and three courses there, and we use this plumb-bob to see that it is plumb, and then we strain a line over this way and lay a number of bricks in proportion. That is the way we will do it." Then he would tell the boys how he was going to strike the joints. He would build that wall with those boys looking at him. "Do you understand that, boys?" "Yes." Then he would say, "William, have this wall torn down and everything cleaned up. Now, boys, tomorrow morning we will go to work," and then the next morning he would say to the boys, "I want each one of you to lay out a wall like I did yesterday. You saw me do it, and I want you to do it. They would start in and he would watch them. "John, don't pick up your bricks that way; this is the way. Bill, you are not doing as I showed you; run that corner up and run this up. George, that is not the way to hold the plumb-bob; hold it this way, and strike your joints this way." Do you think those boys would learn anything? I think in six months' time I would have pretty good bricklayers out of those boys. After that I would teach them how to put a wall up; I would take them on pressed brickwork, and I would teach them how to run arches, and I think those boys would learn more under six months' instruction of that kind than they would in six years in your building, with nobody to tell them, and just to pick up what they wanted.

Marc Eidlitz, New York: Mr. President, I will say for the information of the gentleman that if he will go to New York next week, on Monday, I would make an appointment with him, and take him to Mr. Auchmuty's trade school, and he can see the boys build walls twenty or thirty feet long, and build arches and piers one day, and the next day they are all torn down.

A. S. Reed, Wilmington, Del.: I want to thank you, Mr. President, for your very lucid explanation. I am satisfied that a boy would learn more in six months, and get more real good knowledge than he gets in four years very often, because he starts at the foundation, and he gets the rudiments, and he knows all about it. I am perfectly satisfied that he can learn it, and that it is the proper way to start.

Mr. Ittner: Mr. President, I desire to ask for a little information. I am a brickmaker, an educated apprenticed bricklayer, and I heard you say in the opening of your remarks that you were not a bricklayer, but that you were an iron man. I want to know where you got your education.

The President: Your president received his education in the public schools of the city of Philadelphia, and graduated from the high school on a Thursday—I won't tell you how many years ago—and on the next Monday he put on his colored shirt and went down to the blacksmith shop, and the first thing he did was to go out and buy himself a leather apron and put it on and go to work.

Mr. Ittner: I meant your education as a bricklayer.

The President: I beg your pardon. I never studied the art.

Mr. Ittner: Mr. President, I wish to say here for the benefit of the members of this convention, so far as my knowledge is worth anything, I have been at the business since I was a boy seventeen years of age, and I do not believe I could have made a better explanation of the way in which a young boy could learn a trade at a trade school, than the president has done, and that is the reason why I put the question in good faith. I have had the opportunity during our session to compliment our good president on his mode of dispatching business, and I also asked the question whether he belonged to any legislative body, and I was told no.

The President: At the Builders' Exchange I learned all this. The Builders' Exchange is an educational school. I might give you a little bit of illustration as to what the Builders' Exchange can do. Brother Sayward did not say that although he knows it. I venture to say there are members of our exchange in Philadelphia who, a few years ago, would have felt that they could not have gotten up and said ten words before ten men; they would want to sink through the floor; and yet, those men can today get up and talk for half an hour before hundreds of people, and they are glad to do it and express themselves in a way that nobody need be ashamed to listen to, or they for the speaking. The builders' exchanges are educational schools. We become educated. I know what I do about bricklaying by the use of my eyes and brains in connection with builders throughout the city of Philadelphia, and I know more about it from having given thought to the subject as to how to educate our boys in this work.

The subject was further generally discussed and much general information relating to trade schools given, after which C. C. Dewstoe, of Cleveland, Ohio, moved that the first, second and third sections of the report of the Legislative Committee on Apprenticeship be adopted, and then as a whole, which was so ordered.

W. H. Foulk, Wilmington, Del.: Mr. President, I had hoped that some gentleman would offer a resolution to appoint a committee to act in conjunction with the Committee of the Board of Trade. I did not want it to come from our exchange. I was waiting very patiently to hear some gentleman make a resolution of that kind.

Secretary Sayward: I move that a committee of three be appointed from this association to confer with a like committee from the National Board of Trade on the matter of petitioning congress to appropriate moneys for the establishment of mechanical trade schools.

The motion was seconded and carried.

The President: As the Committee of the National Board of Trade consists of a gentleman from Wilmington as chairman, one from New York City and one from Philadelphia, in order that they may all be in near connection one with the other, I will name Mr. James Sharkey, of Brooklyn; Mr. William Harkness, Jr., of Philadelphia, and Mr. Marc Eidlitz, of New York, to act in connection with that committee. The secretary will please send word to the National Board of Trade to that effect.

The report of the Legislative Committee on Insurance Against Accidents to the Public was read by Assistant Secretary Voshall, as follows:

REPORT OF LEGISLATIVE COMMITTEE ON INSURANCE AGAINST ACCIDENTS TO WORKMEN AND OTHERS.

At the first convention of the National Association, the question of insuring workmen against accidents was discussed upon a resolution offered by the delegation from New York, the purport of which was, that it would be desirable to perfect a plan whereby the workmen upon buildings in process of erection would be certain to receive some sort of indemnity in case of accidents, they to participate with the owner in payment of premiums on such insurance.

The committee appointed at the first convention found that there were companies existing who would issue a policy of insurance by which builders could *protect themselves from liability* in cases of accidents to workmen. This method was simply shifting the liability from the shoulders of the builders to the shoulders of the insurance companies, and while satisfactory enough from the standpoint of protection to the employer, did not cover the idea comprehended in the original resolution.

They also found that it was possible to secure through these same companies certain other insurance which would give a stated indemnity, in quite small amounts, to cover the men whether at work or not, and in their report, made at the second convention, they recommended this plan as worthy of trial.

The Legislative Committee have made further study of this important question during the past year, and in the course of their investigations have found that a practical effort in the general direction of the form of insurance contemplated has been made by a certain firm of architects in the city of Chicago.

The method adopted by this firm seems to be worthy of careful consideration, it being an illustration of what can be accomplished, and suggestive of further and more complete protection to the employer, *combined with* indemnity to the employed.

The plan of action taken by these architects (we are permitted to state that it is the firm of Adler & Sullivan, of Chicago) is briefly stated, thus:

In the case of two particularly large buildings the architects were made *trustees* in behalf of all persons employed thereon, The Employers' Liability Assurance Corporation of London issuing a specially prepared "blanket" policy, covering everybody employed from the moment he came to the building.

The indemnity guaranteed was, in case of death by accident, a payment of (2,000) two thousand dollars to the heirs of the person killed. and in case of injury a payment of two-thirds wages of person injured during time of disability; this payment, however, not to extend beyond ($3) three dollars per day.

The premium demanded by the company was quite heavy (two per cent on the pay-rolls of the various contractors, which the said contractors were required to pay immediately after each regular pay-day), but the risk taken by the company

was a large one, and the conditions peculiar, for a man injured immediately after coming to the building for the first time would be entitled to indemnity, although his name had not even gone upon the pay-roll, and therefore no premium whatever paid on his account.

The policy covers only such men as are engaged in or about the building, in the discharge of their regular duties and during regular working hours.

This arrangement has apparently worked to the satisfaction of all concerned, although the architects speak of the payment of premiums by the contractors as being somewhat burdensome, for the reason that they "pay out large sums from which they get no return, except, perhaps, in the consciousness that they have been instrumental in securing a moderate provision for their men in case of injury."

It occurs to your committee that this plan has some features which are better than the method recommended a year ago, inasmuch as it is simpler and does not pretend to cover the men except when actually engaged on or about buildings in process of erection, and gives a more substantial indemnity.

They are of the opinion that it may be arranged so as to combine protection for the employer against claims for damage, *together with* the payment of insurance to the workmen.

Their plan would be, as far as the placing of the insurance is concerned, and the payment of premium therefor, virtually the same as that of Messrs. Adler & Sullivan (which may, of course, be so extended as to include workmen engaged at shops and yards); but beyond that, to secure immunity to the employer from claims for damage, it should be a part of the consideration with all employés that a percentage of their wages will be retained every pay-day to secure this insurance, the employer simply acting as their agent in placing it and paying the premium, and it should be a further consideration that they will accept the indemnity under it, *as an exemption to the employer from any claim on account of accidents.*

The wages under such a system as this would naturally become larger to the extent of the premiums paid, but contractors need not feel it burdensome (as Messrs. Adler & Sullivan apprehend they may), for they can readily add the necessary percentage to cover the premiums, when making their estimates.

It may be argued that this is a plan for *compulsory insurance*, but as it really would not reduce the wages of the workmen, and would, on the other hand, make them feel somewhat more independent than if it were done solely as a charity by the employer, and as the employer would be relieved from the constant threatening of suits for damage when he is in no way at fault, it seems as if the result was worthy of the means taken to attain it.

Your committee understand that a system somewhat similar to this prevails in certain foreign countries as a part of the common statute law, but while deprecating any attempt to secure legal enactments to this end, they hope that the convention will take action to establish some such custom as this which they have outlined.

As a suggestion, they recommend that the action taken be, a direction to the Executive Board to open correspondence with the accident assurance associations in this country, secure the adoption of a form of policy of the character suggested, and when secured have all filial bodies fully and properly informed in relation to it. Filial bodies should also be informed of the proper and legal methods to follow in setting this insurance in operation so as to make the exemption of the employer from claims sure and certain.

In addition to the insurance of workmen, your committee also urge that the Executive Board be also directed to endeavor to secure the adoption of a form of policy with accident associations which will protect the builder from damages occurring from accidents to the public.

In this connection they would call the attention of the association to the effort being made to arrange for this sort of insurance by the Fidelity and Casualty Company of New York.

Respectfully submitted,
MARC EIDLITZ,
WILLIAM HARKNESS, JR., } *Committee.*
E. L. BARTLETT,

It was moved and seconded that the report of the committee be received and the recommendation of the committee be adopted.

The motion was seconded and carried.

Secretary Sayward: I move that the secretary be directed to issue proper notice prior to the next annual convention of an amendment to the constitution to the effect that any person who shall serve a term as president of this association shall by virtue of that service become a permanent director of this association in addition to the directors already provided for.

The motion was seconded by Marc Eidlitz, of New York, and carried.

Richard Deeves, of New York, read an interesting paper upon the apprenticeship system.

W. H. Foulk, of Wilmington, Del., moved that a vote of thanks be tendered to Mr. Deeves for his essay, and that it be spread upon the journal of the convention.

The motion was seconded and carried.

Secretary Sayward stated that he had received a letter from Denver, stating that certain letters had been received from him, and saying, "We are very much interested in the National Association, but our Exchange has as yet been unable to do anything in that direction. We would be very much indebted if you would send us reports of what was done at the convention, and will be represented at the next."

Secretary Sayward stated that he had also received a letter from Wichita, Kansas, wherein they also say that the Builders' Exchange of Wichita has the question of joining the National Association under consideration, and will probably decide favorably at an early date. He stated that he had also received a communication stating, "Our old friend, D. J. A. Sullivan, of Charleston, S. C., sends his regards to us all, and that he is very sorry he is unable to be present, and says, 'Draw on me for the assessment for the next year. Kindest regards to Mr. John Stevens and all the other officers.' He also incloses stamps to send the report of the convention."

On motion, adjourned until Thursday morning, February 14, at 10 A.M.

THIRD DAY—MORNING SESSION.

At 10 o'clock President Stevens called the convention to order. Assistant Secretary Voshall called the roll.

The president introduced Mr. John McArthur, Jr., who read an address prepared by O. P. Hatfield, Esq., of New York, treasurer of American Institute of Architects, on "The Relation of the Architect to the Builder." (Printed on page 16.)

John J. Tucker, New York: Mr. President, it seems to be out of place, perhaps, for the representatives of New York, but I deem it of such vast importance that I cannot afford to let the opportunity go by, to at this stage rise and move a vote of thanks to Mr. O. P. Hatfield for the very able and instructive paper which has been read. It affords me pleasure to supplement the motion with the statement that it is due, in a large measure, to this association that we are getting such papers that are going to prove of such vast importance to the building fraternity of this land. I am only too glad the opportunity is afforded me to make the motion.

Secretary Sayward: In seconding the motion offered by Mr. Tucker, of New York, I would like to add that the thanks of this association be tendered to Mr. McArthur for the reading of the manuscript of Mr. Hatfield, of New York.

John J. Tucker: I will add that a copy of the address be printed in our proceedings for the benefit of this association, and that we deem it of so much importance that a pamphlet form be printed and be disseminated throughout the land, so that all builders and architects may receive a copy for their guidance in the future.

The motion, as amended, was seconded and carried.

The President: I feel I can congratulate the builders of New York City on having such complete plans and specifications prepared for their use. No doubt Mr. Hatfield has given us a resumé of what they do in New York. Not exactly what the architects do, but what the architects of New York ought to do. I am also glad to see that there are a few of our Philadelphia architects present, and I trust, without any further comments, that they will do likewise. The next order of business will be an address by Mr. George Eastburn, M. A., on the metric system. Mr. George Eastburn has made a great study of this matter and is rather enthusiastic on the subject, and I think we all ought to be. It has often impressed my mind that if we, in our good judgment, thought it wise to adopt the decimal system, and I think no one will doubt the wisdom of such a course who has ever had to calculate in pounds, shillings and pence, it would also be wise for us to adopt that system in connection with our weights and measures. The old-fashioned way of adding up farthings and dividing by the number, and leaving the remainder and carrying the other over, and so with the pence and shillings, is about the same thing we have to do today with our feet and inches. We add up inches and divide by 12, set down the remainder and carry over, etc. It seems to me it would be a very wise and useful thing, and would expedite business if we could only have the same decimal system applied to our calculations and measurements. Professor Eastburn will tell you more about it than I can.

Professor Eastburn having been introduced by the president, and having exhibited to the convention some of the apparatus, together with a chart used in illustrating the metric system, proceeded to read his address. (Printed on page 23.)

George C. Prussing, Chicago: Mr. President, I move that a vote of thanks be tendered to Professor Eastburn for his very interesting paper, and I desire to say that it might be fitting for this body to take the same steps taken by other bodies to correct the absurdities which now exist, and I would move you that a committee be appointed exactly in the same language as that given by the lecturer as coming from the Western Association of Architects, so that the committees will have the same powers as granted by the Western Association.

The motion was seconded and adopted.

Assistant Secretary Harkness: I have an order to read directly in the line of the motion of Mr. Prussing, of Chicago. It is as follows:

Ordered, That the secretary of this association be directed to correspond with other organizations interested in the adoption of the metric system of weights and measures for the purpose of coöperating with them in any efforts they may be making for the establishment of this method of weighing and measuring.

The order, as moved, was seconded and adopted.

The President: You will now have the pleasure of listening to an address of Col. Richard T. Auchmuty, of New York, founder of the trade schools of that city. I hardly know in what terms to introduce the colonel to you, but to our Philadelphia Exchange, or to our Boston Exchange, he needs no introduction. He is the gentleman, not being satisfied with the work that he is doing in New York with a view of educating the American youth there in the mechanical business, he is so generous that he has come to Philadelphia and has gone to Boston, and has offered to the exchanges in those cities a large sum of money to enable them to start the same kind of trade schools.

The address on trade training by Col. Richard T. Auchmuty, of New York, founder of the mechanical trade schools of that city, was long and listened to with much attention.

The President: It does my heart good to witness the enthusiasm with which you have received Colonel Auchmuty's address that he has just delivered. I feel in my heart that you cannot do him too much honor for the great work to which he has devoted his life and the encouragement that he is giving to others to follow in his footsteps. If the name of the Master Builders' Exchange of Boston or Philadelphia is to be called blessed because they do the work that he teaches them to do, what shall be accorded unto him and his name?

J. J. Weaver, Philadelphia: I move that the address be not only printed in our proceedings, but be printed separately for distribution among the several exchanges of the country.

George Tapper: It gives me great pleasure to second the motion of my brother from Philadelphia. I hope it will be carried unanimously, and that it be printed and distributed to every exchange in the country.

The motion was carried.

Assistant Secretary Voshall read the following resolution:

WHEREAS, It has come to the knowledge of this board that strenuous efforts are being made on the part of labor unions in this and other states to have the conspiracy laws repealed, therefore, be it

Resolved, That the delegates to the convention at Philadelphia be instructed to urge upon delegates from other states and cities the necessity of using their influence personally and as exchanges to the end that the conspiracy laws of the different states will not be tampered with.

Submitted by the delegates of the Master Builders' Exchange of Syracuse.

John Moore, Syracuse: I move that the resolution be referred to the Committee on Resolutions. We sent a resolution to the legislat-

ure of the State of New York, whereby we endeavored to control our business by local act, and the resolution was presented from the organization at Syracuse, so that all you gentlemen here, representing different organizations, should feel an interest in protecting yourselves as against the labor unions of this country.

A member from New York: I would state that the bill is already slated to go through, and unless some effort is taken, it will be passed by the majority of the New York State Legislature. The bill can be killed by proper action, but it may be carried through on account of inaction.

At the request of the president, Professor McAllister, superintendent of the public schools of Philadelphia, addressed the convention, and described the Philadelphia Manual Training School.

A member from Cincinnati: Mr. President, we seem to be here this morning in connection with trade school matters. I desire to state that Cincinnati has already gone into the good work; that at a meeting of the Commercial Club held last week in our city $30,000 were subscribed in one hour.

Mr. Prussing moved that a recess of half an hour be taken, which motion was seconded and carried, and the convention then adjourned until 1:30 P.M.

THIRD DAY—AFTERNOON SESSION.

At 1:30 P.M. President Stevens called the convention to order. The first business before the convention being the report of the Committee on Resolutions Mr. A. McAllister, of Cleveland, Ohio (chairman), reported as follows:

"The resolution regarding the appointment of a committee to take into consideration the procuring of the organization of a fire insurance company to assure builders' risks, under the auspices and patronage of the Builders' National Association, was referred with a recommendation that it be passed."

The committee reported in favor of the adoption of the resolution presented by the New York delegation in reference to legislation in the different states of the union, making it a felony for any person or association preventing or hindering any American youth from learning any trade or handicraft.

The committee reported in favor of the adoption of the resolution proposing that the thanks of the association be tendered to the Hon. Benjamin Butterworth, of Ohio, for his manly defense in congress of the United States of the rights of American citizens.

The committee reported back the resolution adopted by the Builders' Exchange of Cincinnati, asking that the association ask the authorities at Washington to let the government work in separate branches, recommending that such action be not taken, as it seemed to be not a matter upon which the convention ought to tender advice to the government.

As a substitute for the resolution introduced by the Kansas City delegation, the committee reported the following:

WHEREAS, It sometimes happens that contractors for the erection of buildings in places other than those in which they may have their headquarters, shall conduct their operations as to injuriously affect the relations existing between employers and employed in such places, therefore,

Resolved, That the National Association of Builders recommend that affiliated bodies instruct their brothers when doing business in parts of the country other than those in which they have established their headquarters, that they consult with the local association where the work is being done as to the methods obtaining there between employers and employed, and conform, as far as may be possible, to the customs of such local association.

The committee reported in favor of the adoption of the resolution introduced by the Syracuse delegation, regarding labor unions.

The resolution offered by the Chicago delegation regarding contractors on public work, was reported favorably upon by the committee, and while several of the recommendations of the committee were discussed, all were adopted as reported upon except this. A long discussion followed, which was largely a repetition of that upon the lien law. Its adoption was ably urged by Mr. Prussing; Mr. Purington and others claiming that its adoption was contrary to the expression of the convention regarding the lien law. The resolution that the report of the committee be received and the resolution (of the Chicago delegation) adopted, was put to vote and defeated.

The report of the committee on time and place of next convention, and nomination of officers, was called for.

John Rowson, secretary of the committee: Your committee appointed to select time, place and selection of officers for the ensuing year, beg leave to report as follows:

Recommending that we hold our next convention in the city of St. Paul, Minn., on or about the 20th day of January, 1890, subject to the call of the president.

Also recommending the following selection of officers:

For president, Edward E. Scribner, of St. Paul, Minn.
First vice-president, John J. Tucker, of New York, N. Y.
Second vice-president, A. McAllister, of Cleveland, Ohio.
Secretary, William H. Sayward, of Boston, Mass.
Treasurer, George Tapper, of Chicago, Ill.

L. P. SOULE, of Boston, *chairman*,
JOHN ROWSON, of Grand Rapids, Mich., *secretary*,
WILLIAM H. STEWART, of Cincinnati, Ohio,
ASHER BASSFORD, of St. Paul, Minn.,
W. A. RUTTER, of St. Louis, Mo.,
} *Committee.*

Mr. E. L. Bartlett, of Baltimore, Md., moved that the time and place named in the report be accepted and adopted, as the time and place for the next annual convention, and that the gentlemen named in the report of the committee be elected to the respective offices by acclamation.

The motion was seconded and carried unanimously.

President Stevens expressed his pleasure upon the election of the several officers, and called upon president-elect Scribner, first vice-president elect Tucker and second vice-president McAllister to express their willingness to fill their respective offices. These gentlemen responded in turn, each thanking the convention for the honor conferred.

In response to the call for naming of directors for the ensuing year, the following names were announced;

DIRECTORS.—E. L. Bartlett, Baltimore, Md.; L. P. Soule, Boston, Mass.; E. N. Hager, Buffalo, N. Y.; D. A. J. Sullivan, Charleston, S. C.; George C. Prussing, Chicago, Ill.; J. M. Blair, Cincinnati, Ohio; R. H. Jenks, Cleveland, Ohio; W. J. Stapleton, Detroit, Mich.; William Mellor, East Saginaw, Mich.; John H. Hoskins, Grand Rapids, Mich.; James E. Shover, Indianapolis, Ind.; W. W. Taylor, Kansas City, Mo.; Garrett Dunck, Milwaukee, Wis.; Barclay Cooper, Minneapolis, Minn.; Marc Eidlitz, New York, N. Y.; William Harkness, Jr., Philadelphia, Pa.; Richard Hayward, Providence, R. I.; William H. Ganslire, Rochester, N. Y.; Frank Clark, Sioux City, Iowa; John DeClue, St. Joseph, Mo.; Daniel Evans, St. Louis, Mo.; Matt Breen, St. Paul, Minn.; William Dickinson, Syracuse, N. Y.; D. C. McCarty, Washington, D. C.; W. H. Foulk, Wilmington, Del.; E. B. Crane, Worcester, Mass. Directors for Brooklyn, N. Y., and Hartford, Conn., were not appointed.

Asher Bassford, St. Paul, Minn.: Mr. President, I have received a response to a message sent to our president after it was ascertained that our next place of meeting was to be in St. Paul, and with your permission I will read it:

ST. PAUL, February 14, 1889.

Asher Bassford, Philadelphia:

St. Paul appreciates the honor conferred upon her, and will open wide her gates to welcome the convention of 1890. If the usual temperature prevails we will display our banana gardens, and if the eastern blizzard strikes us we will build an ice palace. In any event, we will make the North, the South, the East and the West feel at home with us. Thank the convention for naming St. Paul.

Signed by the president of the St. Paul Exchange.

In behalf of the Exchange of St. Paul, I thank this convention for naming St. Paul as the place for the next convention. I do not think I can say or do more than to freely and fully indorse all the president has said in his dispatch, with the exception of the banana gardens. I cannot indorse that. I expect to meet you one and all in St. Paul next January, and it will be our aim to make it so agreeable that no one will regret having paid us a visit.

Mr. A. J. Campbell, of New York, stated that he had been appointed the chairman of a special committee, which was not called upon to make a report, but that the committee had attended to its duties, and it gave him great pleasure now to present the badges to President Stevens, George C. Prussing and J. M. Blair, the three ex-presidents of the association, which he did in a well-composed and comprehensive speech, which was responded to by the recipients of the handsome tokens of past presidentship.

The following resolution was then read by Mr. Blair, of Cincinnati, in behalf of his delegation:

Resolved, That the delegates to the third annual convention of the National Association of Builders, assembled in the city of Philadelphia, hereby confess their inability to express a proper appreciation of the hospitality shown them by the Master Builders' Exchange of this city.

That the "brotherly love" for which this metropolis has always been noted, has been manifested on this occasion in such exuberant, overwhelming fashion that we feel as if the "high tide" of the art of entertaining has here been reached, and that it would be useless for other cities to imitate, much less to equal it.

To the officers and members, therefore, of the Master Builders' Exchange of Philadelphia, we extend our simple thanks—we recognize, under all the outward manifestation of hospitality, *that which we value much more highly*, namely, friendship. *Friendship*, that quality which illumes the pathway of life, smooths away the asperities of business, and makes the conduct of all our affairs more even, just and true.

Builders of Philadelphia, we are your friends, and you are ours. To whatever city of this country you may go, in which exists a filial body of this association, be assured that you will find a welcome equal in fervor, if not equal in the magnificence of manifestation, which you have extended to us.

The resolution was seconded and carried by a standing vote.

Three cheers were then given for the Master Builders' Exchange of Philadelphia.

Mr. Harkness announced that there would be a meeting of the board of directors for 1889 held in the headquarters of the Boston delegation, room 16, Continental Hotel, at 4:30 P.M.

Thomas R. Bentley, of Milwaukee, moved that Colonel Richard T. Auchmuty, of New York, be made an honorary member of this association.

The motion was seconded and adopted.

Mr. Harkness stated that the Builders' Association of Pennsylvania desired to make the first contribution to the next convention, to be held at St. Paul; that they desired to know the address to which they should send the banner now hanging across the street.

Secretary Sayward, on behalf of the Boston delegation, offered the following resolution:

Resolved, That the thanks of the association be extended to the press of this city for the full and complete reports they have given of the proceedings of this convention.

The motion was seconded and adopted.

Mr. Isaacs, of New York, called a meeting of the delegates in room No. 4, Continental Hotel, to confer on the matter of the attempt to repeal the conspiracy laws, at 4:30 P.M.

The President: I wish, on behalf of the Builders' Association, to thank the gentlemen of the convention very kindly for their attendance at this time. You have come from various sections of our country, many of you living thousands of miles from here; but we are glad to welcome you, and if we have done that which has ministered to your comfort and enjoyment while we have been attending to the greater and more important matters of business that has come before the association, we are only too glad.

John J. Tucker, New York: I desire to thank the gentlemen of Pennsylvania for the handsome compliment that was paid me by this beautiful bouquet which was presented to me this morning. On behalf of the New York delegation I thank them for it, and, with their permission, I ask that it be extended and delivered to the lady of our worthy retiring president, Mrs. John S. Stevens.

On motion, the convention adjourned *sine die*.

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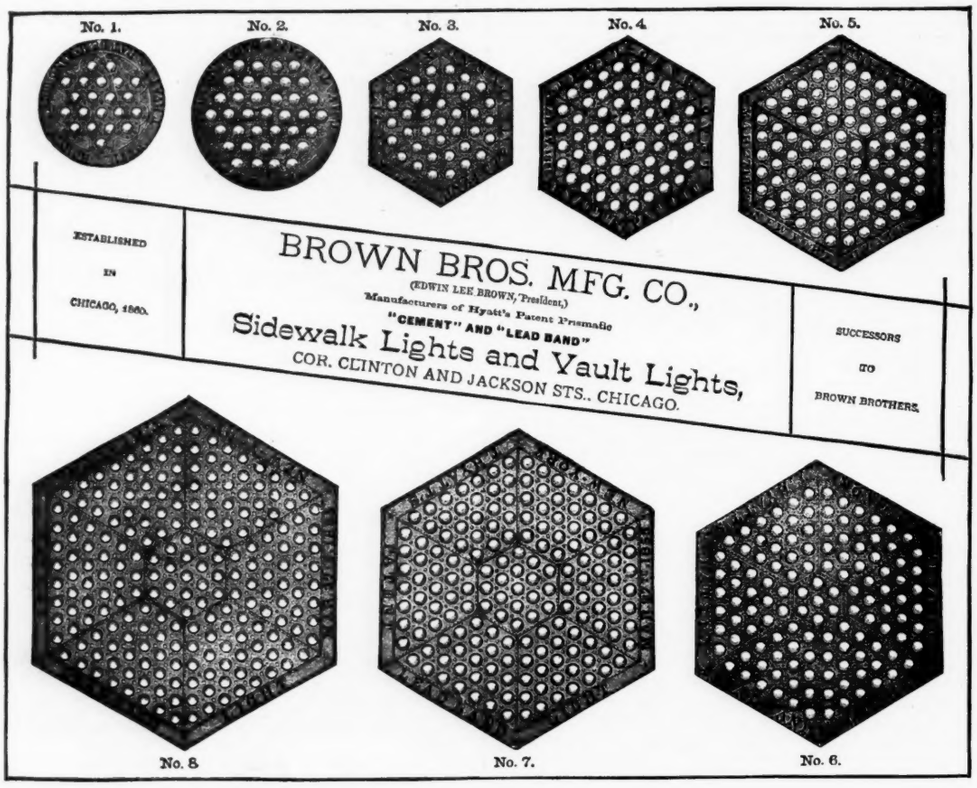

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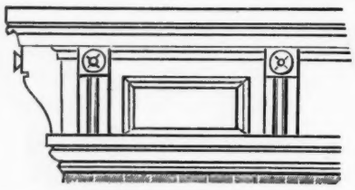

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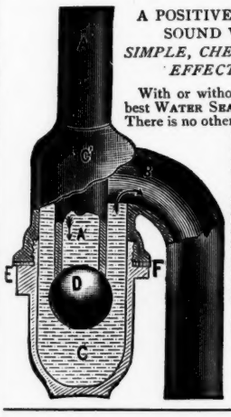

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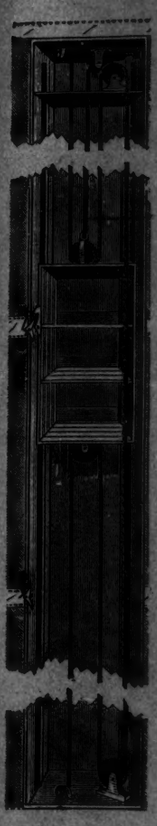

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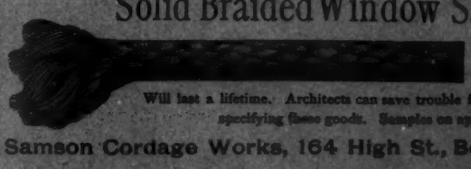

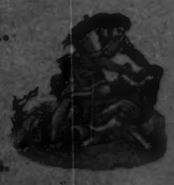

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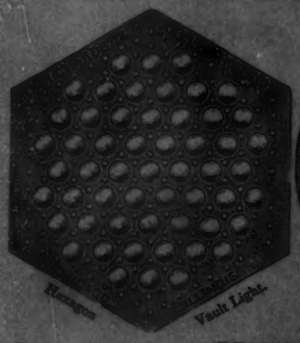

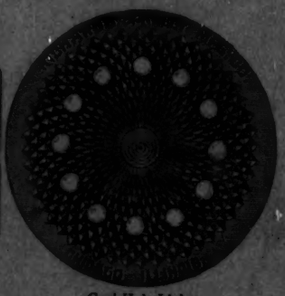

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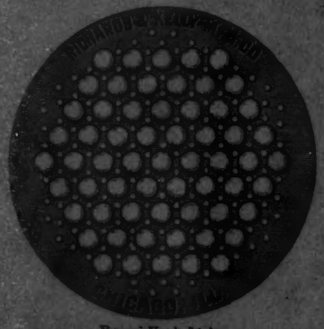

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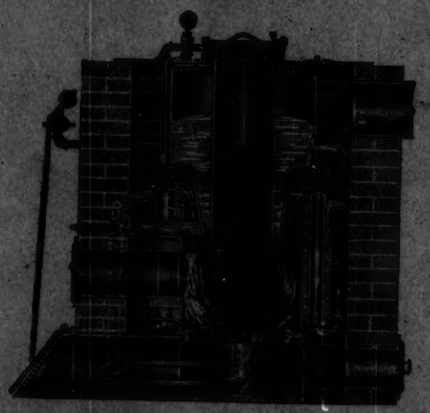

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